

## 2.0 ENVIRONMENTAL AND CULTURAL CONTEXTS

### 2.1 ENVIRONMENTAL OVERVIEW

The study area is within the Coastal Plain physiographic province, a relatively flat expanse of Pleistocene/Holocene-age landforms dissected by rivers (Jordan 1964). Within this province, portions of the study area are associated with either headland or bay barrier landforms related to the present local relative rise in sea level linked to the present deglaciation of the Earth (Fletcher et al. 1990, Knebel et al. 1988, Kraft et al. 1976). Thus, the study area is underlain by either Holocene age sediment, deposited over the last 10,000 years attributed to barrier-lagoon environments that have transgressed the area due to the present sea level rise, or the upper portions of the Omar Formation, barrier-lagoon deposits associated with the late Pleistocene (Groot and Jordan 1999, Groot et al. 1990, Fletcher et al. 1990, Knebel et al. 1988, Kraft et al. 1976, Jordan 1964).

Soils within the initial study area consist of coastal beach and dune land (Co), Evesboro series (EvA, EvB, and EsD), fill land (Ft), and tidal marsh (Tm) (Figure 3). The coastal beach and dune land (Co) soils are described as unconsolidated sands that have been deposited and reworked by wave, tidal, and wind processes (Ireland and Matthews 1974). The tidal marsh (Tm) soils are extensive within those portions of the project area influenced by the present tidal range (Ireland and Matthews 1974). These soils are represented by an A horizon of very dark grayish-brown clay loam with abundant roots and plant remains to varying depths overlying a C horizon of bluish-gray to dark gray silty clay loam that have varying depths (Ireland and Matthews 1974). The fill land (Ft) within the study area consists of those areas that have been filled with 2 feet or more of displaced soil or geologic material (Ireland and Matthews 1974). The coastal beach and dune land (Co), fill land (Ft), and tidal marshes (Tm) are most common within the study area.

In the larger study area and in the vicinity of the Fresh Pond Wetland Mitigation Area, the primary soils, the Evesboro series, are described as sandy soils that are very deep and excessively drained (Ireland and Matthews 1974). A general soil profile of an Evesboro series soil begins with a dark grayish-brown loamy sand plow zone (Ap) extending to depths of approximately 23 centimeters (cm) (9in) below ground surface (Ireland and Matthews 1974:15-17). The Ap horizon exhibits an abrupt boundary with the B horizon composed of a yellowish brown loamy sand that extends to a depth of 79cm (31in) (Ireland and Matthews 1974). Below the B horizon, a C horizon of pale brown sand that abruptly changes into a strong brown sandy loam at approximately 178cm (70in) below the ground surface (Ireland and Matthews 1974).

Currently, the immediate vicinity of the Indian River Bridge consists of State Park lands. The State Park lands are used for recreational purposes (camping, fishing, boating) and are generally seasonal in nature, although are increasingly used on a year-round basis. South of the Inlet, beach front housing has encroached on the barrier dune. In the Fresh Pond Wetland Mitigation Area, the area is characterized by mixed woodlands, field, and wetlands (fresh and saltwater). The lands are owned by Delaware State Parks.



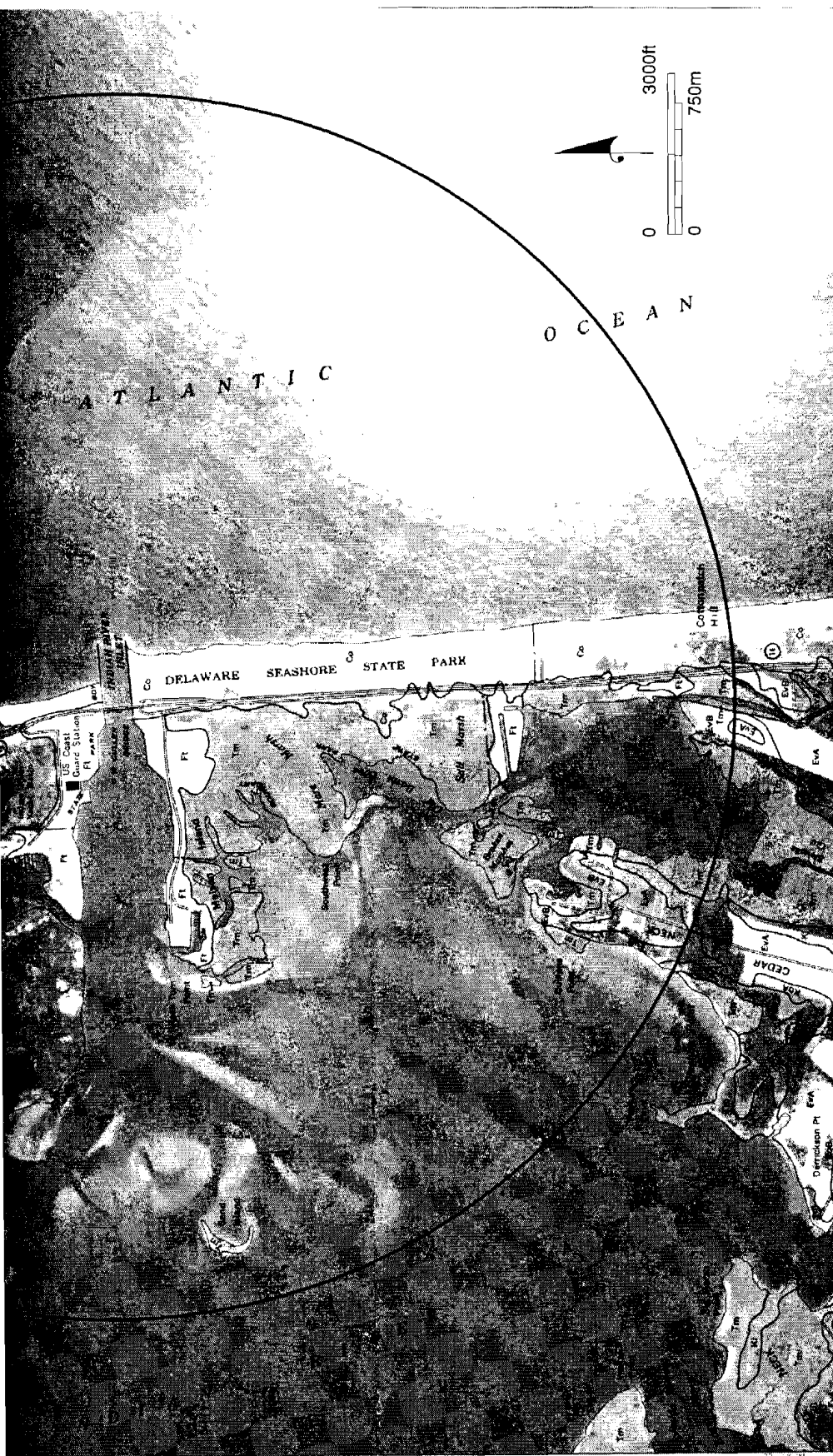


Figure 3. Detail of Sussex County Soil Survey (Ireland and Matthews 1974), Sheet Numbers 46 and 54.

## 2.2 PREHISTORIC AND CONTACT PERIOD OVERVIEW

The following brief, general discussion provides an outline of the prehistoric cultural record of the lower Delmarva Peninsula as it is currently understood (e.g., Custer 1984a, 1986a, 1987, 1989; Custer et al. 1983; Thomas et al. 1975). Archeologists working in Delaware have divided the prehistoric archeological record of the Delmarva Peninsula into five major periods:

- Paleoindian Period (*circa* 14,000 - 8,500 yrs B.P.);
- Archaic Period (8,500 - 5,000 yrs B.P.);
- Woodland I Period (5,000 - 1,000 yrs B.P.);
- Woodland II Period (1,000 - 350 yrs B.P.), and;
- Contact Period (A.D. 1650 - A.D. 1700).

### 2.2.1 PALEOINDIAN PERIOD

Native Americans first inhabited Delaware sometime after 14,000 yrs B.P., based on dates from Paleoindian period sites in the eastern United States (Custer 1989:81-86). Small family groups of Paleoindians lived a wandering existence, hunting animals that roamed the shifting woodland and grassland mosaic of the time. Game animals may have included musk ox, caribou, moose, and the extinct mastodon; however, modern game animals, such as white-tailed deer, were also present in the region (Custer 1989:95-98). Extinct megafauna (mastodon, mammoth) and large northern mammals (e.g., moose, caribou) roamed the continental shelves at the time (Emory 1966; Emory and Edwards 1966; Edwards and Merrill 1977). The Paleoindian stone tool kit was designed for hunting and processing animals. Wild plant foods supplemented the diet. Distinctive "fluted" points, characteristic of the early Paleoindian period, show a preference for high quality stone (Custer 1984b). Use of coastal resources during the Paleoindian period is not known primarily because sea-level rise has drowned the contemporaneous shore (Fletcher 1988; Kellogg 1988; Solecki 1961). Knowledge of the Paleoindian period is, therefore, limited and skewed to the interior of the North American continent.

### 2.2.2 ARCHAIC PERIOD

The beginning of the Archaic period in Delaware is marked by major changes in human adaptations (Custer 1989:122). By 9,000 yrs B.P., northern species of plants and animals had migrated out of the Mid-Atlantic region. Temperate plant and animal species were more common, and climate patterns had become more like those of the present. Few Archaic sites have been excavated in Delaware, however, so what is known is extrapolated from other areas (Custer 1989:127-129).

The major change in the archeology is a wider variety of tools in the Archaic tool kit. Human adaptations became more generalized during the Archaic period, and foraging for plant food resources was an important activity. Archaic period tool kits were less specialized than the earlier Paleoindian tool kits and included plant processing tools, such as grinding stones, mortars, and pestles. A seasonal, mobile lifestyle exploiting a wide range of resources and settings was probably common. Custer et al. (1986) found that Archaic period sites occur in a wider variety of settings than Paleoindian sites. Archaic period sites appear to have been occupied for longer periods of time, perhaps on a seasonal basis by flexible kinship-based groups (Custer 1989:129). Exchange of stone

for tools tied people together across large areas of the eastern United States, enabling more elaborate exchange networks later in time (Custer 1989:140).

Recent excavations at two sites have added to our knowledge of Archaic period occupations of peninsular Delaware. The Blueberry Hill site (7K-C-107), in Kent County near Dover, was occupied in late Paleoindian and early in the Archaic period (Heite and Blume 1995). Evidence of site occupation was sealed and separated by sediments moved by winds during a period of drier climate (see above). The site was situated on a low knoll overlooking a stream confluence and was infrequently occupied for short periods of time probably as a hunting and gathering camp. The Two Guys site in Sussex County (7S-F-68) was probably first visited intermittently during Paleoindian period times, but was not visited frequently until the Early Archaic period and again during the Late Archaic period (LeeDecker et al. 1996). The site is situated on a sandy ridge in an area of extensive, upland wetlands. Evidence for Middle Archaic period occupation of the Two Guys site is sparse (LeeDecker et al. 1996).

### 2.2.3 WOODLAND I PERIOD

The Woodland period in Delaware has been subdivided into the Woodland I (or Late Archaic, Middle Woodland, and Early Woodland) and the Woodland II (or Late Woodland) (Custer 1984a:28; 1989:33-38). The Woodland I period, ca. 5,000 to 1,000 yrs B.P., is the first period which is well-represented on the Delmarva Peninsula. The period is characterized by a certain degree of sedentism, increased population densities, and a greater degree of contact and exchange between native groups. Woodland I period occupations in Delaware focused on the mid-drainage zone, which in eastern Sussex County is now closer to the coast due to the sea-level transgression (Custer and Mellin 1987:66).

Several distinct cultural traditions, or complexes of artifactual and behavioral traits, can be distinguished within the Woodland I period (Custer 1987:33-43; 1989:141-297). In addition, artifact styles changed and first, stone, and later, ceramic vessels were added to the technology. The Clyde Farm Complex exhibits some continuity in stone artifacts with the late Archaic, but includes soapstone (steatite) bowls, Marcey Creek type ceramics, and experimental pottery wares. Heavy woodworking tools, such as axes, adzes, celts, and gouges, were also more common. Between 2,500 and 2,000 yrs B.P., two contemporaneous cultural complexes existed in Delaware: Wolfe Neck and Delmarva Adena (Custer 1987:249). The Wolf Neck complex is characterized by grit-tempered, cord and net-marked pottery. The Delmarva Adena is slightly younger than the Wolfe Neck Complex and is distinguished by mortuary ceremonialism, artifacts made of materials from outside the region (e.g., Ohio), and more complex social systems (Custer et al. 1990; Thomas 1987; Thomas and Warren 1970). Delmarva Adena peoples also used pottery tempered with grit and/or crushed pottery or burned clay.

The Cary Complex is identified by Mockley shell-tempered ceramics, and stemmed Rossville-like stone points among others (Custer 1987:276-289). The earliest date for shell-tempering on the Delmarva Peninsula is about 1,700 yrs B.P. (Custer 1989:276). Mortuary ceremonialism is not found during Cary Complex times (Custer 1989:277). Homogeneity in the Cary Complex on the Delmarva Peninsula broke down by ca. 1,400 yrs B.P. and regionally distinct cultures developed, especially in northern Delaware. In southern Delaware, the Cary Complex continues and developed into the Woodland II Slaughter Creek Complex (Custer 1989:289).

Although the subsistence/settlement systems for the Woodland I period are thought to be generally similar to those postulated for the Archaic period, there appears to be a greater degree of complexity due to changes in the social organization. An additional factor is the development of modern-type coastal environments and greater diversity in environments. Numerous Woodland period sites have been investigated in the region as discussed below.

A Woodland I period shell midden (heap) site on Cape Henlopen was investigated because the "Great Dune" was advancing over it (Custer and Mellin 1987:24-65). The site (7S-D-9) was a small base camp where a small semisubterranean pit house was filled with domestic remains after its occupation (Custer and Mellin 1987:64-65). Carey Complex peoples occupied the site during the winter exploiting a variety of aquatic resources. Deer and hickory nuts were also part of the diet. Other shell midden sites along Cape Henlopen, first described by Leidy (1865, 1866), were probably also Wolfe Neck Complex "micro-band base camps."

The Wolfe Neck site (7S-D-10), also known as the Moore Shell Midden site (e.g., Weslager 1939), is a stratified, multi-component Woodland I period site that provided the data on which the prehistoric ceramic typology for the region was refined (Griffith and Artusy 1977). The lower levels of the site are representative of the Wolfe Neck Complex. Coulbourne clay-tempered ceramics were found in overlying deposits, while shell-tempered Mockley ceramics were found in the upper-most strata of the shell midden (Griffith and Artusy 1977). Coulbourne ceramics are associated with the Delmarva Adena (Custer 1989:173). Mockley ceramics are considered a technological precursor of the Woodland II Townsend ceramic series (Custer 1989:173-174). Custer (1989:254-255) classifies the Wolfe Neck site as a micro-band base camp.

The Wilgus site (7S-K-21), on Cedar Neck, is a "micro-band base camp" occupied by Delmarva Adena and Carey complex people (Custer et al. 1983). The site lies near the "Reservation" development on the east side of Cedar Neck Road. The Adena occupation of the Wilgus site is represented by an Adena-type bifacial stone tool and debitage of Flint Ridge Chalcedony from Ohio, a gorget, and Coulbourn ceramics. Artifacts were recovered from the plowzone in the habitation area of the site on a low knoll. On the slope below the knoll, was a series of Delmarva Adena middens, each approximately eight meters in diameter. Some of the midden areas had been buried by slopewash and were unplowed. Some of the middens contained oyster and clam shell, while others were identified as a dark, rich soil with artifacts. Food remains represented in the middens included freshwater fish, deer, snake, turtles, and birds. Seasonality indicators suggest fall, winter, and early spring occupation of the site. Numerous *Amaranth* and *Chenopodium* seeds were recovered by flotation (Custer 1989:256-257). A new ceramic type identified at, and named for, the Wilgus site is both shell- and clay-tempered. Wilgus ware filled a gap in the ceramic sequence between clay-tempered Coulbourn wares and later, shell-tempered Mockley wares, demonstrating continuity in regional occupation. Mockley ceramics indicated occupation of the Wilgus site by Carey Complex people (Custer 1989:278).

#### 2.2.4 WOODLAND II PERIOD

The Woodland II period, ca. 1,000 yrs B.P. to A.D. 1,600, is characterized by a high degree of sedentism (Custer and Mellin 1987) and a breakdown in the exchange systems which existed in Woodland I times. The reasons are not well understood, but it has been suggested that population



pressures may have played some role. Although sedentism is often associated with the introduction of agriculture, which provides a steady and reliable subsistence base, only meager evidence suggests that agriculture provided a significant portion of the diet for people living in southern Delaware. However, previous investigations in the Sussex County coastal region have discovered the remains of probable cultivated plants (e.g., corn, amaranth seeds), and recent excavations at the Two Guys site in Sussex County recovered evidence of a cultivated variety of sumpweed (LeeDecker et al. 1996:136-138). In addition, and perhaps of more importance, marine resources were a primary source of food during the Woodland II period. The Woodland II period is fairly well-known in the Lewes/Rehoboth area because of extensive early work by the Sussex Society for Archaeology and History (SSAH).

### 2.2.5 CONTACT PERIOD

The archeology of the Contact period, *circa* A.D. 1600 to present, is very poorly understood because no clear-cut contact period sites have been identified and thoroughly investigated in Delaware (Custer 1989:340; Grumet 1990:193, 202, 204). Intermittent contact between Native Americans and Spanish and other explorers is poorly documented, but oral traditions imply contacts prior to attempts at European colonization (Grumet 1990:192-193). Seventeenth century and later historical documents contain many references to interactions between Native Americans and Europeans (e.g., Davidson 1982; de Valinger 1940, 1941; Mayre 1936a, 1936b, 1937, 1938, 1939, 1940).

The Dutch were the earliest European settlers on the western shore of Delaware Bay. Their presence was well established by the middle of the seventeenth century (Grumet 1990:199-201). Fort Swaanendael and a Dutch West Indies Company outpost near Lewes was established in A.D. 1631. The first settlement was wiped out and the buildings burned after a misunderstanding between the Dutch and the local inhabitants (Weslager 1969). Somewhat later, seventeenth century European settlements were situated on, or very near, late Woodland II period, Slaughter Creek component sites in the Lewes/Rehoboth area. Early historic cultural material was also found in close association with Native American material, or in separate features, on several sites excavated by the SSAH (e.g., Bonine 1956:31). It is likely that European settlers moved onto the clearings associated with Native American sites. Weslager (1942) quotes Lindstrom in associating the name "Sironesack with a large village at Lewes occupied by natives rich in corn fields." The place is also referred to as "Chenonnessex," "Checonesseck," "Sikonesses," or "Sickpnesyms" (Weslager 1942, 1943a). Land near Lewes was "purchased" from the Indians by the Dutch in 1629. The names of Quesquakous and Ensanques, inhabitants of "Sickonesyns," appear on a recording of the deed made in Manhattan the following year (Weslager 1949).

Native American culture and society was almost completely shattered by European colonization. People were forced off their traditional lands and populations were decimated by disease (e.g., Grumet 1993:2). Migrations and political alliances between neighboring groups led to cultural amalgamations that make it difficult to reconstruct pre-contact cultural systems based on existing documentation and archeological data. Nonetheless, some Native Americans were able to maintain their identities and communities. In 1711, the Maryland assembly set aside 1,000 acres for a reservation in what is now southern Delaware; however, most of the land was apparently sold off in the 1740s (Marye 1940; Porter 1979:327-329). Many Native Americans left the area at the time to join other groups to the north (Porter 1979:329-330, 1987:46-48). Those who remained in the

region withdrew into the hinterlands and were able to survive in relative isolation (Porter 1979:331-334). The archeological record for this period is unknown in Delaware; however, the Burr/Haines site in Burlington County, New Jersey (Zebooker and Thomas 1993) may provide a model for the type of archeological site that may be representative of a protohistoric Native American occupation.

Racial tensions and segregationist laws, some arising from the tensions that led up to the Civil War, led to a legal classification of many Native Americans as “Negro” or “mulatto” (Porter 1987; Weslager 1943b). Racial tensions continued to affect Native American populations in Delaware for many years. In 1875, the Delaware legislature passed a tax measure to support segregated schools (Porter 1979:39-342, 1987; Weslager 1943b). The Nanticoke were considered non-white and so were subject to the new law. The Nanticoke protested and resisted the tax resulting in a new law, passed in 1881, recognizing the “Incorporated Body” which allowed the Nanticoke to establish their own schools. The 1881 law did not specify the cultural identity of the Incorporated Body, so the Nanticoke appealed to the Delaware Assembly for explicit recognition of their Native American heritage in 1903. Nonetheless, the assimilation of the Nanticoke into western society continued and the Incorporated Body languished somewhat (Porter 1987:72-73).

Near the turn of the century, the relatively new discipline of Anthropology belatedly recognized the existence of remnant Native American populations in the eastern United States (e.g., Babcock 1899). Frank Speck, an Anthropologist at the University of Pennsylvania, began a long association with the Nanticoke in 1911 (Porter 1987; Weslager 1943b). With Speck’s assistance the Nanticoke sought stronger legal status and a legal charter incorporating the Nanticoke Indian Association was acquired. The Nanticoke continue the struggle to maintain their cultural identity (Clark 1987, 2000; Porter 1979, 1987:79-84). Other communities of Native American descent are also seeking recognition in Delaware. Despite the difficulties in recognizing Native American archeological sites after European colonization (Custer 1989:340-341; Porter 1979:333), there has been a continuous Native American presence in Delaware from prehistoric into historic and modern times.

## 2.3 HISTORICAL OVERVIEW

Delaware’s recent past, comprising approximately three centuries, has been organized into five temporal study units, as defined by the *Delaware Comprehensive Historic Preservation Plan* (Ames et al. 1987). These units form the basis for an appropriate chronological framework for the investigation of the state’s historic resources. In an effort to coordinate the study of historic archeological and architectural resources, these temporal study units were adopted unaltered in the *Management Plan for Delaware’s Historical Archaeological Resources* (De Cunzo and Catts 1990:119).

The following regional historical summary is presented to provide a brief background on important local and regional historical events that shaped and affected the inhabitants of Sussex County. Descriptions of regional historical events are based in large part on the works of Munroe (1978, 1984), Hoffecker (1977), Hancock (1976), and Scharf (1888).

### 2.3.1 EXPLORATION AND FRONTIER SETTLEMENT (1630 TO 1730)

The first permanent settlement in the vicinity Lewes was made in 1630 and was known as Swanendael (“valley of swans”). About a decade earlier the Dutch West Indian Company had



established a trading post on the west side of Delaware Bay (then called Godins Bay after Samuel Godyn, a company supporter) (Weslager 1969). The new colony of Swanendael was located near the Dutch West India trading station at Whorekil. It was sponsored by the patroons of the Dutch West India Company, and under the direction of Samuel Godyn and Samuel Bloomaert. Swanendael was created for the purpose of whaling and raising grain and tobacco. This venture was privately financed, but it ended when a miscommunication and lack of cultural sensitivity led to the deaths of all of the Dutch settlers by the local Indians, the Sickoneysincks, in 1632. After the destruction of the settlement, the Dutch abandoned any attempts to settle the lower Delaware valley for several decades and focused instead on their holdings in New Amsterdam (modern New York) (Zebooker et al. 1996).

Farther north a group of Swedes in the employ of the New Sweden Company built Fort Christina in 1638 in what is now part of the present City of Wilmington. Fort Christina thus became the first permanent European settlement in Delaware. The Swedish government supported the venture, and Fort Christina, located at the confluence of the Brandywine and Christiana creeks, became the nucleus of a scattered settlement of Swedish and Finnish farmers and traders known as New Sweden (Weslager 1987).

By 1647, the Dutch West India Company in New Amsterdam recognized that the Swedes posed a potential threat to their colonial interests along the Delaware, or South, River, especially with regard to control of the fur trade. Accordingly, they reoccupied Fort Nassau on the eastside of the Delaware River and erected a new fortification, called Fort Beversreede, at the mouth of the Schuylkill River in southeastern Pennsylvania (Myers 1912:43; O'Callaghan 1858:58). Essentially, the Dutch claimed the land that the Swedish colony occupied—from the Schuylkill River south—by right of prior discovery. In 1651 the West India Company responded to the Swedish colonization by building Fort Casimir at the Sandhook, the present site of New Castle. The Swedes, recently reinforced, retaliated by seizing the fort in 1654 and renaming it Fort Trinity. A year later, in 1655, the Dutch reacted by dispatching a large military expedition (seven ships and over 300 men) to the Delaware Valley. The expedition not only recaptured Fort Trinity, but also captured Fort Christina, the principal Swedish garrison in the colony (Dalhgren and Norman 1988). As a result, New Sweden ceased to exist as a political entity. Nonetheless, many Swedish and Finnish families remained in the region, continuing to observe and maintain their own customs and religion.

In 1657, as a result of peaceful negotiations, the City of Amsterdam, the Netherlands, acquired Fort Casimir from the West India Company, and founded the town in the environs of the fort called New Amstel. This was a unique situation in American colonial history—a European city became responsible for the governance of an American colony.

For over a quarter-century, the region around Lewes was not formally occupied by Europeans. An ill-fated expedition from Virginia attempted to establish itself near Cape Henlopen in 1657, but the settlers were captured by the local Native Americans and ransomed by the Dutch in New Castle (Zebooker et al. 1996:I-11). The Dutch erected a small fort at Lewes, called the Whorekil [also spelled Hoerenkil, Horekil, Horekill, and Hoorekill], near the mouth of the Delaware Bay in 1659 for the purpose of blocking English incursions. In particular, settlers from the Chesapeake Bay region and Virginia were encouraged to move east by Lord Baltimore, who considered the lands of the Delmarva peninsula as part of his Proprietorship (De Cunzo and Catts 1990:30). The military occupation at Lewes was abandoned in 1662, and the fort was vacated (Weslager 1991:28).

Several Dutch families built homes at the Whorekil (Lewes), including Dutch Mennonites under the leadership of Cornelius Plockhoy, who established a semi-socialistic community there in July of 1663. They too were under the supervision of local officials appointed by the burgomasters of Amsterdam. The Mennonite colony was known as the "Sekonnessinck on Horekill," after the local Native American tribe. The Plockhoy colony continued to exist in the area after the English gained control of the Delaware River settlements in 1664, and was still present in the early 1670s (Weslager 1991).

English hegemony of the Delaware River and Bay area began in 1664 when Sir Robert Carr attacked the Dutch settlement at New Amstel on behalf of James Stuart, Duke of York, brother of Charles the II. This was an important move on the part of England to secure her economic position in the New World. The settlement at the Whorekil was also seized and pillaged by the English.

A transfer of political authority from the Dutch to the English then followed, and the Dutch settlers who swore allegiance to the English were allowed to retain their lands and personal properties with all the rights of Englishmen. Former Dutch magistrates continued in office under the Duke of York's authority, and the Swedes, Finns, and Dutch alike peacefully accepted the rule of the Duke of York through his appointed governors. In 1670, Governor Lovelace established the first local court at the Whorekil. By 1671 the population of the Whorekil consisted of 47 individuals, both Dutch and English (Gehring 1977:100).

It was reported at that time that the Marylanders were unlawfully settling within the boundaries of the Duke of York's lands, specifically about 20 miles from the Whorekil in the vicinity of Assawoman Inlet. Indeed, in 1670 Lord Baltimore had created a new county, called Durham, which encompassed all of the lands presently occupied by much of the State of Delaware (Papenfuse and Coale 1982:11). Between 1670 and 1682, when William Penn became the Proprietor of the lands from the Whorekil to New Castle, Baltimore issued at least 45 warrants for lands on the west side of the Delaware Bay, along "Duke Creek" (probably Duck Creek) Slaughter Creek, Prime Hook, Indian River, and Whorekil Creek (Skirven 1930).

In 1673, during the third Anglo-Dutch war, the Dutch recaptured New Netherlands, including New Amstel and the Whorekil. The Dutch retained possession of the region for a short time only, returning the lands to the English in 1674 in exchange for the captured Dutch colony of Surinam. The short war had an impact on the settlers at the head of Delaware Bay, however, for in December of 1673, the Maryland government sent an expeditionary force of forty men to the Whorekil, which was burned and pillaged for a second time in less than a decade (deValinger 1950). Following the peace treaty, the English again regained control of the region.

In 1682, the granting of proprietary rights to William Penn and his representatives by the Duke of York essentially gave political and economic control of the Delaware region to Philadelphia, the new seat of government in Penn's colony of Pennsylvania (Munroe 1978). Two years earlier, in 1680, Governor Edmund Andros had established the County of Deale, which included the settlements at the Whorekil northwards to Cedar Creek. Governor Andros encouraged settlement of the Whorekil region, particularly around the town of Whorekil and further south at Indian River and Assawoman Inlet. Between 1676 and 1678, 47 land patents were issued by the Duke of York's

government for lands in the area, all fronting on the coast or on navigable streams and rivers (Hancock 1976:17).

With Penn's arrival in 1682, the name of Deale County was again changed, this time to Sussex County, and the name of the town of Whorekil was changed to Lewes, the county seat of the English county of Sussex. In 1682 the first surveyors of highways and bridges were appointed for the county. Sussex County at this time was heavily forested and swampy, and settlement in the county for much of this period was confined to an area within about 10 to 12 miles of the coastline, extending inland along a line running roughly from modern Milford-Milton to Harbeson-Millsboro-Dagsboro. Gristmills were established in Lewes in 1676, on Broadkiln creek (Milton) by 1695, and on Bundick's Branch soon thereafter.

Lewes was the only town of any size in the county, and it became a political, maritime, and commercial center for the region. Anglican, Presbyterian and Quaker houses of worship were established in Lewes by the end of this period. A second Presbyterian Church, the Cool Springs Meeting House, was erected about six miles west of Lewes on Cool Spring Branch by 1728. Yards for shipbuilding were present in Lewes by the early 1680s (Hancock 1976:21).

The population of Sussex County is estimated to have been less than 1,000 persons by 1700. The majority of the inhabitants were farmers, raising crops of tobacco (the primary medium of exchange), corn, wheat, and rye. Hogs and cattle were also raised. The exporting of cattle, by driving them overland from Lewes to New Castle, appears from the records to have been a significant source of income for the settlers of Sussex (Munroe 1978:198).

Political relations between the Three Lower Counties and Pennsylvania deteriorated, and by 1704 representatives from Sussex County began to meet with legislators from New Castle and Kent Counties in a separate assembly at the Town of New Castle. The Governor continued to be appointed by Pennsylvania. Economic and social ties, however, continued to link the Lower Counties with Philadelphia throughout the seventeenth and eighteenth centuries (Munroe 1954).

### *2.3.2 INTENSIFIED AND DURABLE OCCUPATION (1730 TO 1770)*

Settlement in Sussex County by the start of this period had penetrated the interior portions of the region, reaching the area of the mid-peninsular divide (just west of present-day Georgetown). Patents for land west of the headwaters of the Broadkiln and Indian rivers, and along Gravelly Branch and its tributaries, were being issued from the Pennsylvania government by the second decade of the eighteenth century (Scharf 1888:1237, 1293). According to one contemporary observer:

The Inhabitants here live scattering generally at 1/2 a mile or miles distance from each other, except in Lewes where 58 families are settled together. The business or Employment of the Country Planters, is almost the same with that of an English Farmer, they commonly raise Wheat, Rye, Indian Corn, and Tobacco, and have Store of Horses, Cows, and Hogs. The produce they raise is commonly sent to Philadelphia ... The people here have generally the Reputation of being more Industrious then they of some of the Neighboring counties.... (Hancock 1962:139).

For most of the eighteenth century, the land remained heavily wooded and overland passage was difficult. Due to the largely riverine and coastal setting of the region, overland routes were generally slow to develop. Instead, water transportation was more common, and many farms and "plantations" (as the local inhabitants referred to their farms) were oriented to watercourses and had their own landings (Zebooker et al. 1996:1-13). Besides Lewes Creek, other navigable waters around Lewes included Canary Creek and Broad Kill (Creek), which was navigable for shallops for a distance of 13 miles (Munroe and Dann 1985).

Throughout the period, farming was the major occupation of the settlers in Sussex County. The farms and plantations in Sussex County have been generally characterized as subsistence farms, operated by poorer farmers and farm laborers, particularly when compared to the farms located in New Castle County (Main 1973:26-32). Tobacco declined from its position as the prominent cash crop in Kent and Sussex counties, and was replaced somewhat by corn and wheat. Along the Atlantic coast and inland bays, initial economic activity in the area comprising the lands that would become Indian River, Dagsboro, Broad Creek, and Baltimore hundreds revolved around forestry, particularly the vast stands of cedar and pine in the Indian River region. Standing timber was harvested for shingles, planks, barrel staves, tanbark, and ships stores. Forest products were shipped by water to Philadelphia, Wilmington, and other ports on the east coast (Herman et al. 1988:3). By the middle years of the eighteenth century, the economy of the Indian River Bay and Rehoboth Bay area included not only logging and agriculture, but maritime concerns as well. The shellfish industry was established in the bays of the county at this time. A constant demand developed for small trading shallops and flat-bottomed coastal schooners. These vessels were constructed at numerous small boat yards that grew up along the Indian River and its tributaries (Carter 1976:43).

The limited extent and development of the road network in the county is shown on Benjamin Eastburn's map of the Lower Counties in 1737 (Munroe and Dann 1985). Major roads included the King's Highway, officially established by an Act of the General Assembly in 1752. It ran northwards from Lewes to Cedar Creek and St. Matthews Anglican Church (built in 1707), and from there to Dover and up country to Wilmington (Laws of the State of Delaware 1797:320, 390-394). The point where the Lewes to Dover Road crossed a branch of the Broadkill Creek is approximately where Red Mill Pond is situated today. From Lewes the main road ran south through St. Georges Chapel to Warwick and the ferry crossing on the Indian River, and from Lewes southeast down the Atlantic Coast towards the Inlet. At St. Georges Chapel (built in 1719), a side road extended down Angola Neck, a site of early settlement in the county (Munroe and Dann 1985). The roads were described at the beginning of this period as "very commodious for traveling, the land being level and generally sandy, so that the people usually come to Church Winter and Summer some 7 or 8 miles, and others 12 or 14 miles" (Hancock 1962:140).

The population of Sussex County grew slowly throughout this period. In 1728, The Reverend William Beckett reported that there were a total of 1,750 inhabitants in the county, consisting of 1,075 Anglicans, 600 Presbyterians, and 75 Quakers. Beckett also noted that there were 241 slaves and free blacks in the county. The presence of so many Presbyterians, Beckett said, was due to the great influx of at that time of Scotch-Irish settlers "of the most bigotted sort" (Hancock 1962:138). By the 1740s, it was estimated that the population of Sussex County was between 1,800 and 2,000 (Pennsylvania Archives 1891), and Hancock (1976:26) estimates that by 1775 there were nearly 14,000 inhabitants. The tremendous growth of the population between 1740 and 1775 may be

attributable to the strong migration of settlers from the eastern shore of Maryland to Delaware lands, as well as to overseas immigration from Great Britain (Munroe 1978:150).

Due to the size of the county and the difficulties in overland travel, some dissension occurred among the inhabitants of the southern and western portions of Sussex County in the 1760s to have the seat of government moved to the Crossroads on the Broadkill (present-day Milton). Several small hamlets formed at this time, mostly located at stream and river crossing points. Besides the Crossroads, also known as Clowes, these hamlets included: Bridgebranch (later Bridgeville) in Northwest Fork Hundred, established in 1730; Warwick in Indian River Hundred, a ferry-point on the upper reaches of Indian River erected before 1750; and St. Johnstown in Nanticoke Hundred, the location of a crossroads village and Presbyterian Church in the last quarter of the eighteenth century.

### 2.3.3 *TRANSFORMATION FROM COLONY TO STATE (1770 TO 1830)*

At the start of this period, the American Revolution dominated the social and political scene in the county. The coastal areas around Lewes bore the brunt of much of the wartime activities, with British blockades and shore raids disrupting trade and commerce along the Mispillion, Broadkill, and Indian rivers. The entrance to the harbor at Cape Henlopen was protected by the erection of a gun battery near present Roosevelt Inlet, and an arsenal was constructed in Lewes during the Revolution. Inland, strong loyalist sentiments among the population prevailed, and in 1780 about 400 Tories took part in the Black Camp Rebellion. The rebellion was headquartered in a swamp about six miles north of Georgetown and was quelled with the use of Kent County militia (Hancock 1976:43). Many of the participants in the rebellion were inhabitants of the poorer regions of the county. They complained of a lack of paper currency, and of destitution for their families. Economic grievances of this sort would continue after the Revolution and throughout the period.

By the start of this period, the century-long boundary dispute between Maryland and Pennsylvania had been decided, and the area west of the Nanticoke officially became part of Sussex County. The addition of such a substantial tract of land spurred the creation of five new hundreds in Sussex County: Baltimore, Little Creek, Dagsborough, Nanticoke, and Broad Creek. These hundreds in "New Sussex" were joined with the five hundreds of "Old Sussex": Lewes and Rehoboth, Indian River, Northwest Fork, Broadkill, and Cedar Creek (Hancock 1976:25). Sussex County thus became the largest of the Three Lower Counties, with a surface area of 94 square miles, nearly the size of both New Castle and Kent counties combined.

By 1800 the population of the county was 19,322 inhabitants. Broadkill Hundred was the most populated hundred in the county, with 2,577 inhabitants (13.3% of the total). Lewes and Rehoboth Hundred was much less populated, ranking eighth out of ten hundreds, and contained only 1,514 people, or 7.8 percent of the whole. Less than 10 percent of Broadkill Hundreds inhabitants were enslaved African Americans, while in Lewes and Rehoboth Hundred, 15.8 percent of the inhabitants were enslaved (U.S. Census 1800).

In 1791, the Sussex County legislature voted to move the county seat from Lewes to the new town of Georgetown, located near the center of the county. As a result of this move, improvements in the transportation network, particularly in the interior parts of the county, were undertaken. By 1796 a

road from Georgetown to Laurel had been established, as well as a road from Georgetown north to Milton and the Broadkill (Sussex County Road Papers 1792, 1796).

Mill dams often provided the easiest means of crossing low, swampy ground, thus becoming ready-made causeways across streams and creeks in the area, focusing transportation networks to some degree on grist mills, saw mills, and mill dams. The mills located at Red Mill Pond on Coolspring Branch are examples of this settlement pattern, as are the roads which cross at their dams. Services, such as taverns, shops, and stores were erected in their vicinities. Mill seats sometimes expanded into larger towns, such as Laurel (1802), Millsboro (1792), and Dagsboro (circa 1780). Other small towns grew up around crossroads and fords, such as Seaford (1799) and Bridgeville (renamed in 1810), and shipbuilding provided the impetus for the further growth of Bethel (1800) and Milton (1807).

Corn agriculture predominated throughout this period in Sussex County, and in the southern part of the county livestock raising contributed substantially to the economy (Macintyre 1986; Michel 1985; Garrison 1988). Homesteads in Sussex County were generally characterized by a frame or log one-and-one-half-story house averaging under 450 square feet of living space, a small orchard of apple and peach trees, and usually about four outbuildings, including a corn barn, smoke or meat house, and kitchen. Nearly half of farms in Indian River Hundred included a smokehouse, 44 percent a corncrib, 36 percent a tenant house, 36 percent a kitchen, 30 percent a stable, and 30 percent a barn (Herman et al. 1988:12). Livestock on the farm might include a herd of hogs, cows, sheep, oxen, and an occasional horse. On most plantations, only 50 percent of the total acreage of the farm were under cultivation (Hancock 1987:24-25). "Out plantations" or "out fields" might be located close by the farm, and were locations of tenant houses or well-used fields.

A form of extensive subsistence farming coupled with home manufacturing dominated the economy of Sussex County during this period. Tench Coxe (1814:76), in his report on the manufactures of the United States for the year 1810, indicated that over 70 percent of the looms in the state of Delaware were located in Sussex County. Over 62 percent of the total value of flaxen goods and over 75 percent of the wool produced in Delaware came from homes in Sussex County. Coxe also reported that the five iron forges in the state were located exclusively in Sussex County and produced 215 tons of iron annually. Twenty distilleries in the county produced nearly half of the annual value of all distilleries in the state. Other categories of manufacturing, like gristmills, fulling mills, cotton and woolen factories, and snuff mills, were located predominantly in the industrial counties of Kent and New Castle.

#### *2.3.4 INDUSTRIALIZATION AND CAPITALIZATION (1830-1880)*

The most significant event to occur within Sussex County during this period was the arrival of the railroad. Prior to this time, the preferred method of long-distance travel out of the county was by steamboat; travel overland was hampered by poor roads. Constructed in the western portion of the county, the Delaware Railroad reached the town of Seaford in 1856 and exited the state at Delmar by 1859 (Hancock 1976:63). The Delaware, Maryland and Virginia Railroad ran from Harrington to Milford, and from Milford south to Georgetown in 1869 (LeeDecker et al. 1992:32). A third line, the Junction and Breakwater Railroad, was constructed between 1859 and 1868, when it reached Lewes (Figure 4). A spur line eventually connected to Rehoboth in 1878 (Hancock 1976:89). The Queen Anne's Railroad, which ran between the Chesapeake and Delaware bays,





Figure 4. Detail of Beers Atlas of the State of Delaware (1868) showing initial 2-mile study area.

was famous in the late 1890s for its excursions to Lewes, but was abandoned in 1924 (Eckman et al. 1955:407).

The arrival of the railroad in the county stimulated changes in agriculture and industry, especially in those areas affected by rail service. The growing of perishable market crops, particularly fruits like peaches, blackberries, and strawberries, became possible after the railroad. By the end of this period, Sussex County was the leading peach-producing area of Delaware. Most of this crop was transported via rail or sea to urban locations. The transportation of the fruit crops was made possible in turn by the establishment of canneries, like the Fruit Preserving Company and the Georgetown Packing Company, both constructed near the railroad depot in Georgetown by the mid-1870s (Scharf 1888:1241). Packing facilities were also constructed in other towns, such as Milton and Bridgeville, at this time (Hancock 1976:88).

By the mid-nineteenth century, the average farm size was 138 acres in Indian River Hundred and 95.5 acres in Baltimore Hundred. Major crops included Indian corn and hogs, supplemented by limited cultivation of wheat, oats, tobacco and cotton. At least half of the average farms in Indian River Hundred consisted of unimproved land. The percentage was nearly as high in Baltimore Hundred (Herman et al. 1988:3,5,18).

Town and village growth was also spurred by the railroad. In central Sussex County the depot towns of Lincoln, Ellendale, and Greenwood were established as direct results of the passage of the railroad. These towns were laid out on a grid pattern of streets, utilizing the rail line as the primary axis. This pattern was a departure from the layouts of the earlier towns in the region. Smaller crossroads hamlets, such as Harbeson (started in 1869) and Bennum, sprang up at the railroad stations on the Junction and Breakwater Railroad between Georgetown and Lewes (Eckman et al.1955:494). The villages of Overbrook and Nassau were also depots on the Queen Anne's Railroad and the Lewes and Rehoboth line (Eckman et al.1955:408). Nassau was a boomtown in the years following the Civil War, and was a shipping point for milk, fruit, and produce. Large apple orchards dominated the area.

The arrival of the railroad allowed the tourism industry to grow in Sussex County during this time period. Beaches and coastal areas had always held a special allure to the region's inhabitants, and with improved transportation means, these areas became more accessible to the urban populations of Philadelphia and Baltimore, who no longer had to rely solely on the steamboat to travel to Lewes. The Rehoboth Beach Camp Meeting was organized by the Methodists in 1873, and the Hotel Henlopen, with 75 rooms, was constructed in 1879 (Hancock 1976:90).

During the late nineteenth century, the population in the water-oriented hundreds increased substantially due in part to the growth of the tourist trade (Herman et al. 1988:21-22). As early as 1860, the development of the coastal resort was noted. An anonymous correspondent of Georgetown's *Messenger* wrote:

Many of our citizens have been trying the virtues of a change of air, scenery, &c., in the places of resort in our county and elsewhere. Lewes has been visited for bathing and fishing, the beaches for the fun and jollity usually found there. Fenwick's Island has been favored with a large number of visitors, large picnic parties having attended there. On Broadkiln beach, "Little Thursday" and

“Barefoot Thursday” have already been celebrated and “Big Thursday” comes off the present week when all are expected to enjoy themselves. With such a continuous love of bay and sea coast, our citizens need not be at a loss for some local bathing place... (*The Messenger* 1860:24, as cited in Herman et al. 1988:103).

Rehoboth Beach, whose name is taken from the Book of Genesis, was named for the large bay located south of Lewes. The neck of land extending between the bay and the Atlantic Ocean was called Rehoboth Neck. Until the extension of rail service, the area of present Rehoboth Beach was a mixture of pine woods, large farms, and sand dunes. Its potential as a beach resort was realized as early as 1855 when the legislature incorporated the Rehoboth Hotel Company and granted the use of five acres located where Rehoboth Neck narrowed into a spit of sand extending south to Indian River Inlet (Carter 1976:37-38).

Actual development did not occur until 1870 when Louis Tredenick erected a combination summer hotel and hunting lodge in an area known as Rehoboth City. This area later became known as Dewey Beach in honor of Admiral George Dewey, the hero of the Battle of Manila Bay in the Spanish-American War. In 1872, the Rehoboth Association of the Methodist Episcopal Church purchased a tract of several hundred acres and laid it out in building lots. This tract encompasses much of the area of the present city (Carter 1976:38).

Daniel G. Beer's *Atlas of the State of Delaware* (Figure 4) depicted the study area vicinity as it appeared in 1868. Most of the study area was undeveloped salt marsh or beach front. The S. Boon residence was shown at the east end of Long Neck. Two residences, those of a Mrs. Quillen and L.W. James, were shown on the present Quillens Point. None of these residences remain standing.

At the outbreak of the Civil War, Sussex County was the largest slaveholding area in Delaware, containing over half of the state's slave population. The vast majority of the slaves were owned by small farmers and worked as domestic servants or field laborers. Free blacks in the county generally owned little land, and like their enslaved counterparts, worked as day laborers and hired farm hands, though some were skilled artisans. As in the rest of Delaware, African Americans were denied the opportunity of education, were not permitted to own firearms, and had their freedom severely circumscribed by laws (Hancock 1976:65). The end of the Civil War and the emancipation of the slaves in Sussex County, though providing freedom, did little to improve their social or economic status.

Several small African American communities sprang up at the end of this period, notably the villages of Belltown, started in the 1840s by Jacob “Jigger” Bell, and Jimtown, both in Lewes and Rehoboth Hundred and in the vicinity of the study region (Eckman et al. 1955:494; Meyer and Kingsley 1990:99-103). The inhabitants of Belltown made their livings working as day laborers in nearby towns like Lewes, or as farm laborers (Meyer and Kingsley 1990:103).

As in the previous historical periods described above, corn agriculture continued to dominate Sussex County. The corn was used to feed livestock, and the small livestock herds of Sussex County were the chief source of agricultural income for the area's farmers. Home manufactures also continued to be a major source of income in Sussex County, long after the practice had been discontinued by most New Castle and Kent county farmers. Between 50 and 85 percent of Sussex

County farmers reported home manufactures as a source of income in the 1849 Census Schedule. The majority of Sussex County inhabitants have been characterized as self-reliant, and often in addition to farming used smithing, carpentry, fishing, milling, tanning, hunting and trapping to supplement to their incomes (Michel 1985:10-12; Garrison 1988).

Industrialization in the county still lagged behind that seen in New Castle and Kent counties. By 1860, 141 manufacturers were located in Sussex County. They included 37 gristmills, 56 lumber mills, 15 blacksmith shops, and six shipyards, with smaller numbers of boot and shoe manufacturers, leather works, agricultural implement shops, fisheries, and wagon and carriage shops (U.S. Census of Manufactures 1865:54). The majority of these industries were oriented towards intra-county services, though shipbuilding touched all areas of the Delaware and Chesapeake bays, with ships constructed at Seaford and Laurel, as well as Milton and Lewes. In addition, the lumber industry was nationally known. By the end of this period shipbuilding in villages like Milton had reached its peak (Hancock and McCabe 1976; Eckman et al.1955:416). Meanwhile, the number of flour and gristmills, though still important in the county, had declined to 26 (Passmore et al. 1978:24).

### 2.3.5 URBANIZATION AND SUBURBANIZATION (1880 TO PRESENT)

An 1880 nautical chart shows the study area at the beginning of this period (Figure 5). Most of the area was undeveloped. The Indian River Life Saving Station is shown at the shoreline north of the inlet. A building is shown on Quillens Point south of the tip of the point. No buildings are depicted on the portion of Long Neck within the study area.

Trends in agriculture begun in the preceding periods continued in Sussex County, and the county remained the most important agricultural section of the state. At the start of this period, corn was still the dominant cash crop. For example, over 1,676,000 bushels of corn were grown in Sussex County in 1900. Today, corn and soybeans, both used as feed in the broiler (chickens) industry, are the primary crops of the county, and the economy of Sussex County is characterized by a "broiler-corn-soybean complex." Several large-scale agribusinesses, such as the Newtons and Cannons of Bridgeville, and the Townsends of eastern Sussex County, dominate the agricultural economy of the county (Munroe 1984:233; Hancock 1976:100-101).

The trends in truck farming and market gardening, started in the 1870s, saw their zenith by 1890, when Sussex County became the peach-producing center of the state. By 1900 over 7 million quarts of strawberries were grown in the county, making Sussex County the leading producer in the nation (Hancock 1976:89). Strawberries were still important to Sussex County farmers in 1935, but disease, labor shortages caused by World War II and high post-war labor prices ended the berry boom (Passmore et al. 1978:73). By the early 1960s, the orchard crops had been supplanted by other, more lucrative, agricultural products.

The holly wreath industry flourished in Sussex County from the 1880s until the 1960s, and many farmers supplemented their incomes during the months of November and December in the holly business. It was an especially significant industry during the Depression, and in 1936 over two million wreaths were shipped from the towns of Bridgeville, Milton, Millsboro, and Selbyville. The industry declined quickly after World War II (Eckman et al.1955:385; Hancock 1976:102).

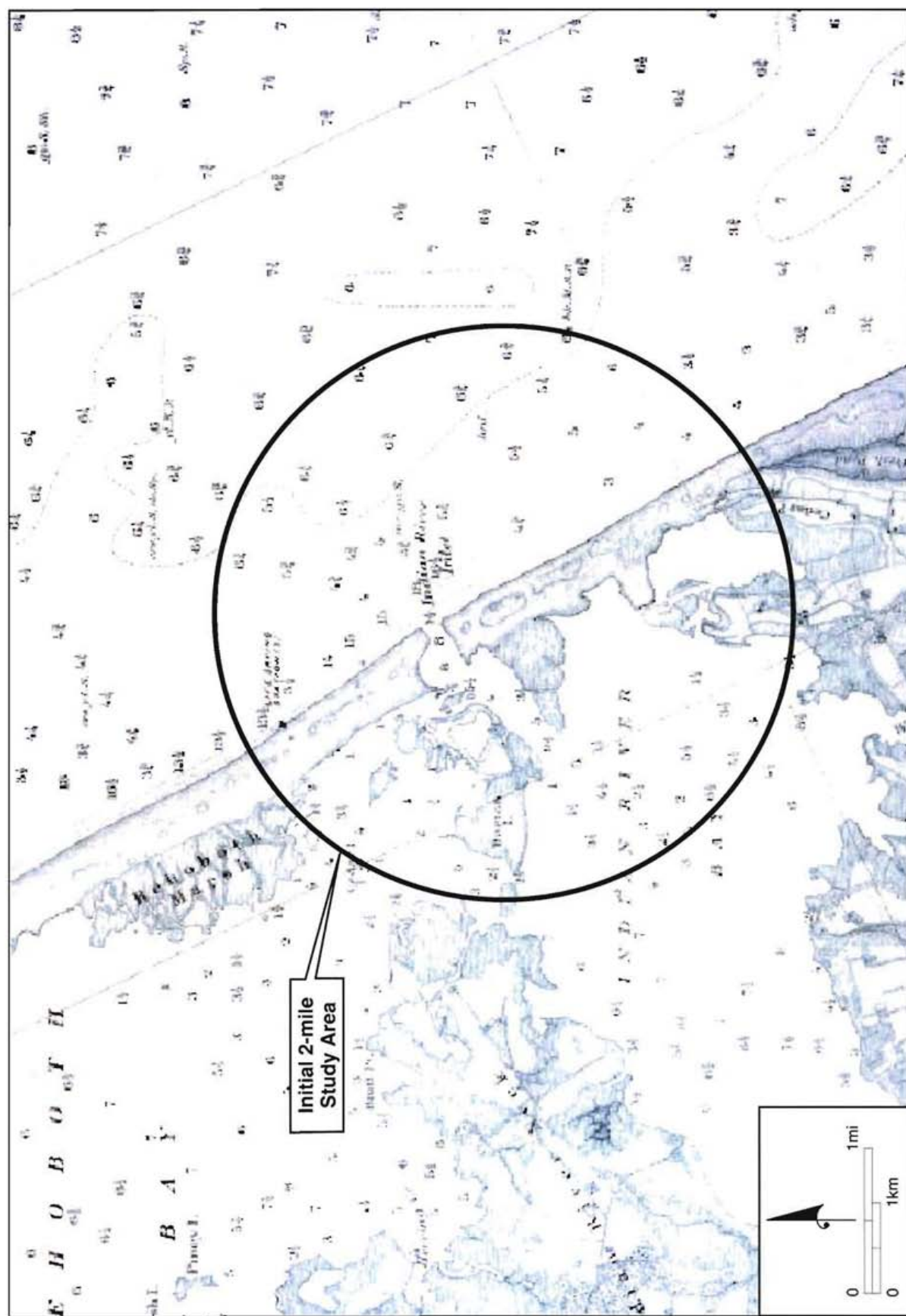


Figure 5. Detail of Nautical Chart (1880) showing initial 2-mile study area.

Tomatoes were an important crop in eastern Sussex County during this period. Sussex County farmers made tomatoes part of a three-year crop rotation system: strawberries, crimson clover, and tomatoes. With tomatoes came the canneries to process them. By 1912 Delaware was supplying one-tenth of the entire U.S. output of canned tomatoes. A primary use of the Lewes and Rehoboth Canal, completed in 1913, was the shipment of tomatoes via barges from landings on Rehoboth Bay and Indian River to Rehoboth canneries (Figure 6). By the late 1930s, the advent of improved roads put an end to water transport of tomatoes (Eckman et al. 1938:409; Passmore et al. 1978:80).

At the start of the twentieth century, the lumber industry was a significant source of income for Sussex County. In 1909 a record amount of timber, over 55 million cubic feet, was shipped from the county. Most of this timber was virgin Sussex pine which had grown following the initial cuttings caused by the arrival of the railroad several generations earlier. Along with lumbering, the charcoal industry was an important related industry of the county. Some charcoal was still being produced in the Redden area as late as the 1950s (Passmore et al. 1978:13,14).

Beginning in the early twentieth century, the agricultural economy of the region began to change with the introduction of large-scale poultry farming and the planting of corn and soybeans (Fitting 1978:24). In 1939, less than 40 percent of the land in Sussex County was farmed. The acreage of land in farms had declined by nearly one-quarter since 1880, and the number of farms in the county had decreased by 15.3 percent between 1910 and 1940. Both of these trends were largely the result of changing economic conditions and the difficulties in farming marginal lands (Bausman 1941:4,7). At that time, one of the major problems confronting Sussex County farmers was drainage, which today has been largely solved through the construction of a vast network of drainage ditches and channelized streams. The growth of corn and soybeans as cash crops in the county has allowed the reclamation of over 35,000 acres of land from swamp and brush to tillable acreage in the last 40 years (Hancock 1976:100).

Grain farming in the late 1930s was spread fairly evenly across the county, with slightly heavier concentrations of farms in Northwest Fork Hundred and in the southeastern portion of the county. Cannery crops, such as lima beans, tomatoes, and string beans, were grown mostly in Broadkill, Cedar Creek, and Lewes and Rehoboth hundreds, while truck crops and fruit crops were mostly produced in the fertile western hundreds. Timber lands, brush lands and open untillable lands were the dominant ground cover in 1941, extending across large portions of the central part of Sussex County (Bausman 1941:16-21). Significantly, the farmers of Sussex County were characterized in 1941 as being more closely tied to the land than the farmers of New Castle or Kent counties. Few foreign born-inhabitants lived in Sussex County, and the vast majority were native Delawareans; "in fact, most of the farmers of Sussex County were born and reared in Sussex County" (Bausman 1941:61).

At the turn of the century, Lewes was still the most important town in Sussex County. With a population in 1899 of 2,000 the town was described as "progressive." Soils in the area were excellent, and crops produced included peaches, grains, and fruits. Villages in the study region included Nassau and Midway, both producers of wheat, corn, potatoes, and peaches (Runk 1899:1482).

Resort towns developed in the early twentieth century. By 1901, the Christian Church Disciples of Scranton [Pennsylvania] formed Bethany Beach as an incorporated town. Several years earlier,



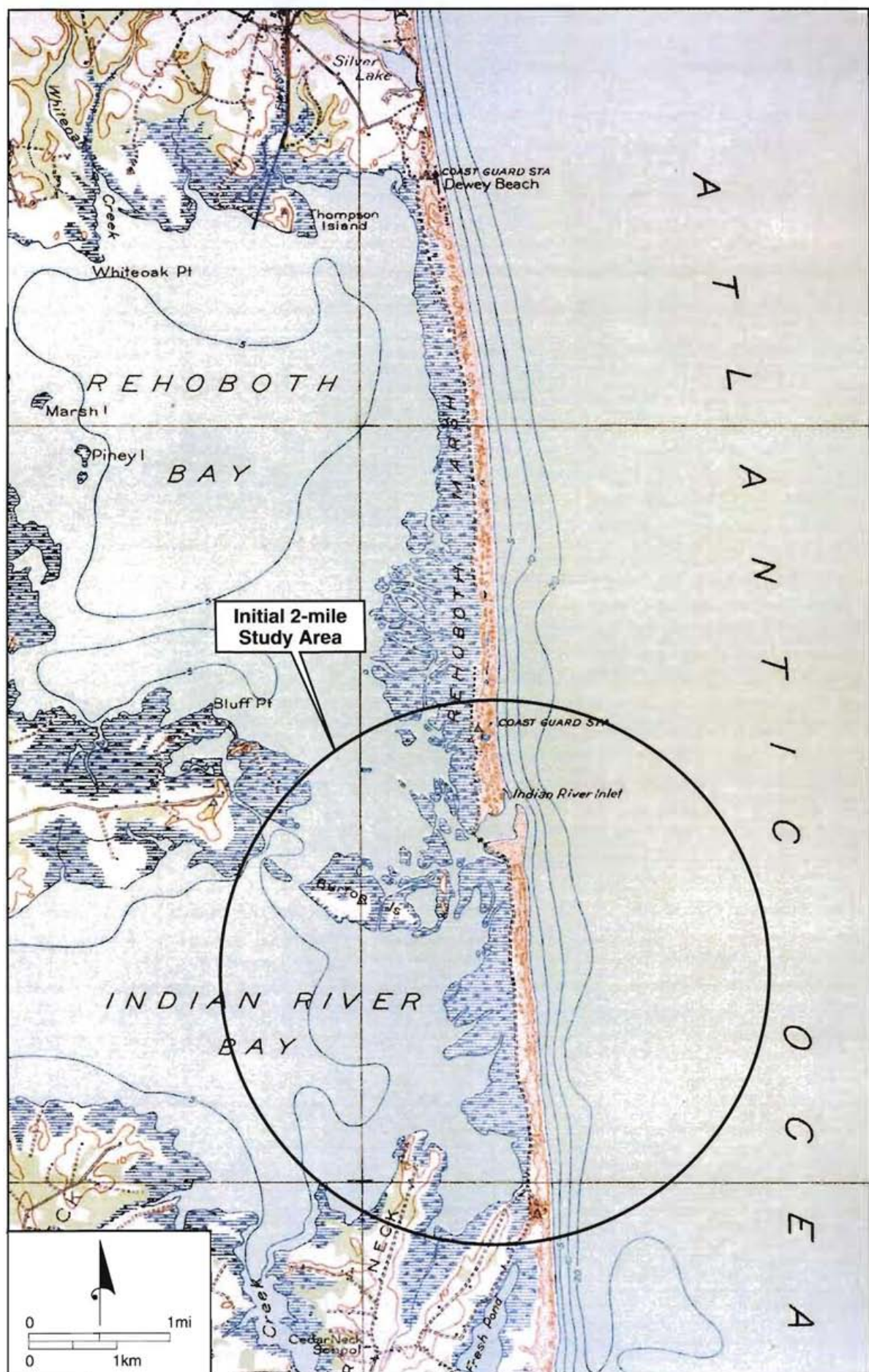


Figure 6. Detail of Rehoboth, Del. 15-minute USGS quadrangle map (1918) showing initial 2-mile study area.

Bethany was the site of a summer religious retreat camp for the Christian Mission Society of Maryland, Delaware, and Washington, D.C. The Church formed the Bethany Beach Improvement Company in 1900 and by the end of that year had laid out a town with 150 house lots (Jones 1995). The new resort was formally dedicated on July 12, 1901 at which time a large tabernacle building was opened (Carter 1976:45).

Also in the early twentieth century, a thriving summer trade developed on the banks of Indian River Inlet and Bay. This trade was based upon sport fishing, bathing, and sailing. Packet boats, buses and trains provided transportation to the area from inland portions of Pennsylvania, Delaware and Maryland (Herman et al. 1988:103). The Indian River Boat Club was particularly active and was frequently mentioned in local newspaper. The May 30, 1940 *Sussex Countian* reported that:

...members of the Indian River Boat Club are expected to open their racing season at Oak Orchard Sunday...[M]any members of the new organization are summer visitors...The event will mark the official inauguration of the current social season, when everyone will be on hand to extend a greeting after a winter's absence (5, as cited in Herman et al. 1988:104).

As the same newspaper later noted, casual sailing was popular, as well:

One very popular method of seeking relief from the heat during the last week is moonlight sailing....Folks who went along for the ride have discovered that the breeze which usually blows across Indian River on moonlit nights is cool (as cited in Herman et al. 1988:104).

The 1918 *Rehoboth, Delaware* 15-minute topographical map depicts the study area in the second decade of the twentieth century. An unpaved road (probably a sand track) extended along the western edge of the barrier island and crossed the then Indian River Inlet on a bridge (Figure 6). The only building shown on the barrier island within the study area was the Coast Guard station, the Indian River Life Saving Station, located north of the inlet. Before the construction of the Ocean Highway, the Life Saving Station was "the most remote and inaccessible station on the Delaware Coast" (Eckman et al. 1938:411). It should be noted that this structure, while still extant, is no longer situated in its 1918 location, but has been moved westward, as the shore line has regressed. A road extended to the eastern end of Long Neck, and a building was shown near the tip of the peninsula. At least two buildings were shown near the north end of Quillens Point.

Internal transportation and inter-regional routes continued to develop and connect Sussex County more fully with the Mid-Atlantic region. By 1910, the Maryland, Delaware, and Virginia Railroad extended from Lewes to Love Point, a ferry landing on the Chesapeake Bay, providing easier access for the people of the western shore of Maryland to the Delaware beaches. Prior to 1917, Sussex County had less than 35 miles of macadam roads, but in that year the first 20 miles of Coleman DuPont's revolutionary concrete highway was completed, connecting Selbyville with Georgetown. By 1924, the DuPont highway (present U.S. 113) ran the length of the state (Rae 1975; LeeDecker et al. 1992). Less than ten years later, portions of the Ocean Highway were completed to Indian River, and extended to Bethany and Fenwick Island by 1937. By the early 1960s, several state-maintained highways (U.S. 13, S.R. 1) made travel both into and out of the

county easier. The improvements in regional transportation in turn stimulated the continued growth in tourism along the beaches (Hancock 1976:90). Presently tourism is a powerful economic force in the county, dominating the eastern portions of Sussex County for much of any given year.

Travel through the study area was facilitated by the construction of the Ocean Highway. As part of this road work a bridge over Indian River inlet, the permanent "fixing" of the Inlet in its present location, and the laying of a gravel road along the barrier island was completed in 1933 (Eckman et al. 1938:411). This new road allowed a direct connection between Bethany Beach and other points south on the barrier island to Lewes and Rehoboth on the north. Travelers no longer had to journey inland and then back to the coast when traveling to coastal towns. This establishment of a direct route facilitated tourist traffic to Delaware's coastal resort towns and led to their growth in the 1940s and 1950s (Gamble and Siders 1997:64).

In the 1930s, Burton's Island was described as "identified by its several tall wind-whipped trees and two small buildings. Historically the shallow flats near the island were famous for the large numbers of soft-shell crabs found there (Eckman et al. 1938:412)

The appearance of the immediate inlet area is shown in a photo taken shortly after the completion of the Cullen Bridge in 1940. The photo (Figure 7), which shows the view from the south side of the bridge toward the north, depicts several flat-roofed, rectangular, masonry buildings fenestrated with six-over-six, double hung, windows located west of the bridge approach. These buildings, which may have been cottages and/or bathhouses, are no longer extant.

During World War II, the south coastal area of Delaware was temporarily transformed into a military installation to guard the mouth of Delaware Bay and its shipping channel. In March 1941, local newspapers reported that the federal government was "building a mighty fortress on Cape Henlopen dunes." The installation, dubbed Fort Miles, cost \$22 million dollars and encompassed 1,011 acres including four miles of ocean beach front (Warrington 1972).

The construction at Fort Miles represented a new generation of harbor and seacoast defenses. It was one of over thirty tactical sites to be fortified (Ross 2002:49-50). Fortification armaments at Fort Miles ranged from six to sixteen inch guns. None of these guns were ever fired.

In association with the fort, eleven concrete control towers used to direct gun fire were erected along the beach front from Lewes south to Fenwick Island (Ostroski n.d.). One of these fire control towers (#2) is located within the study area of the present investigation.

A 1958 photo, taken from the road north of the Cullen Bridge, shows the gabled roof, wood-framed Log Cabin restaurant (no longer extant) west of the roadway (Figure 8). The corner of a second building, possibly a cottage, is shown at the far right of the picture. Vegetation-covered sand dunes rose from the land east of the roadway.

In 1965, the State of Delaware established the Delaware Seashore State Park on 2,825 acres of land including Indian River Inlet. Six years later, the state purchased the Indian River Inlet Marina located on the north side of the inlet. This marina presently contains 292 wetslips, pumpout

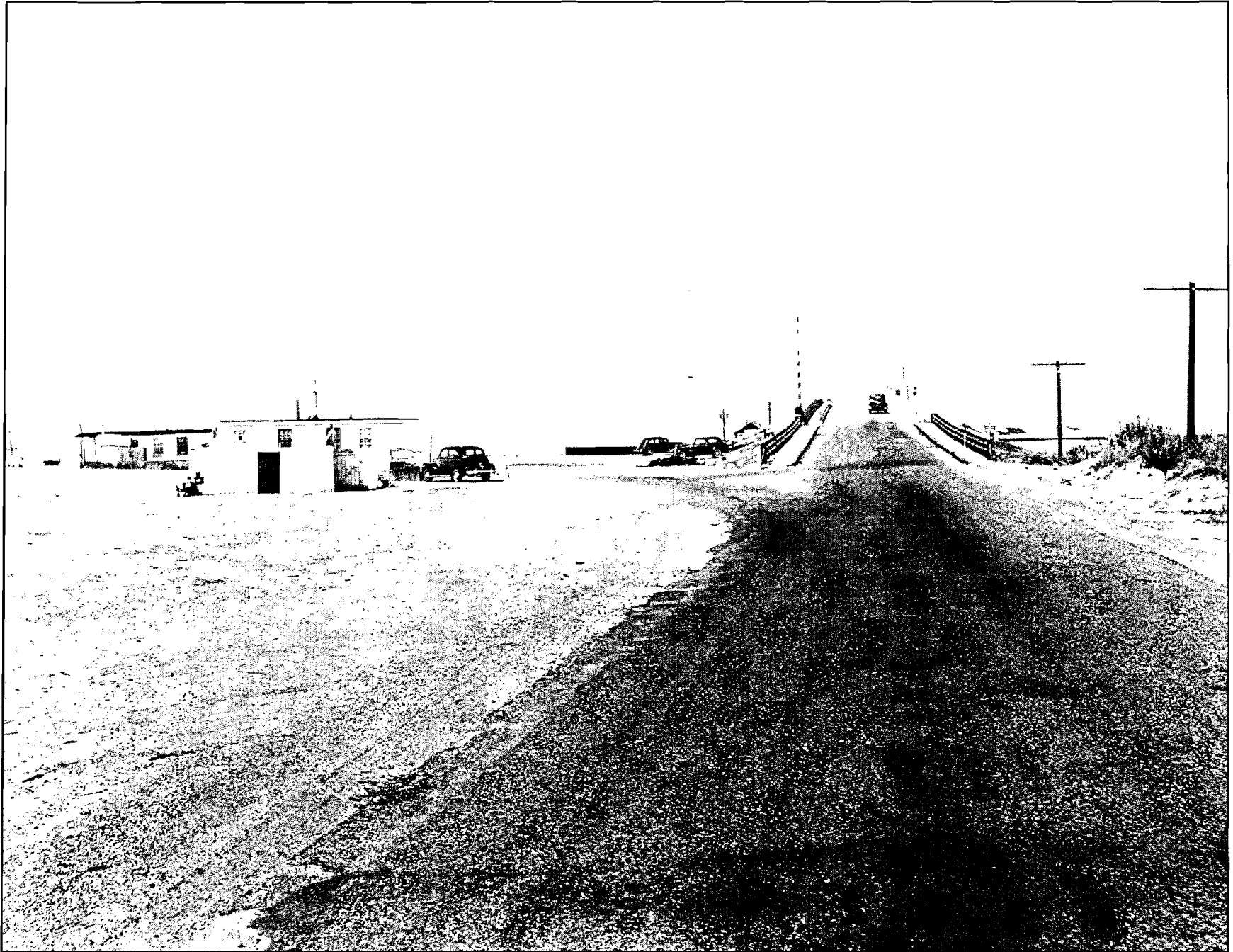


Figure 7. View north from south side of Cullen Bridge. June 1940. Delaware State Highway Department collection. Image #0326. Delaware Public Archives, Dover.





Figure 8. View south from north side of Cullen Bridge. 1958. Delaware State Highway Department collection. Image #0325. Delaware Public Archives, Dover.

services, a public boat landing, a marina operating building, a fish cleaning station, and a marina services building (DNREC 2003).

## 2.4 MARITIME OVERVIEW

The Delaware coast like the barrier islands from North Carolina to New Jersey have been a deadly location for ships from the age of discovery to the present day. Delaware's coast has a special danger with its near shore shoals that migrate over time and flat land surface disguising its river and bay entrances. Atlantic storms can rapidly move the shoals and inlets sometimes closing old entrances and opening new ones to compound the problems for shipping. The danger to shipping has been recognized since colonial times, and the early construction of lighthouses and life-saving stations were attempts to identify the hazards, save ships, and rescue survivors (Trapani 2002). The Atlantic coast of Delaware north and south of Indian River Inlet, leading to the Indian River and Rehoboth bays, have continually claimed numerous ships both known and unknown (Marx 1987:162-165).

There is a natural movement of beach sediments caused by erosion and deposition due to tides, long shore drift and waves that alter coastlines and barrier islands. Severe storms, gales, and hurricanes can alter a coastline; devastate anything natural and man-made, and close inlets and/or open new ones in less than a day. In the last 400 years there have been hundreds of storms along the Delaware/Maryland coast, but a half a dozen have been noted as particularly severe (Hoyt and Langbein 1955:331-432). The storms/hurricanes of 1821, 1889, 1903, 1933, 1936, and 1962 were major coast altering events (Hurley 1995). The devastation and cost to lives and property from storms/hurricanes has been more extensive over the years as the area has become more populated and ship traffic increased. The few records of the 1821 storm/hurricane that slammed the Delaware/Maryland coast indicate there was a tidal wave associated with it that increased the destruction and loss of life (Hurley 1995). The 1889 storm was so severe that even the Life-Saving crew evacuated Ocean City, Maryland (Hurley 1995). In the 1903 storm, the ocean washed away 50 ft. of beach to 7 ft. in depth in Ocean City, Maryland (Hurley 1995).

The August 1933 storm was so intense that it cut two new inlets from the ocean to Sinepuxent and Assawoman bays at Ocean City, Maryland (Hurley 1995). The same 1933 storm severely damaged the boardwalk, streets and drainage systems in Bethany Beach, Delaware, and caused major property losses and beach erosion in Rehoboth Beach, Delaware (Franklin 2000). In Lewes, Delaware, this hurricane produced a 6-ft. plus storm surge (Franklin 2000). Damages to the recently-completed Ocean Highway were reported, particularly north of the Inlet (see Section 2.5 below).

The Indian River Inlet was a deep dredged stone lined engineered entrance in 1939 relatively unaffected by coastal storms (Trapani 2003). There have been five different Indian River Inlet locations from 1800 to the present (Figure 9) and possible more additional smaller temporary inlets in the area in the past (Trapani 2003). Historically documented tidal inlets within the survey area include the circa 1800, 1868, 1882, and 1918 inlets. The circa 1800 inlet is located approximately 2280 feet (695 meters) south of the present Indian River inlet. The inlet then moved progressively north of the present inlet and was located approximately 1709 feet (521 meters) north circa 1868, 3083 feet (940 meters) north circa 1882, and 4455 feet (1358 meters) north of the present inlet circa 1918. By circa 1926, there was no inlet breaching the bay barrier between Atlantic Ocean and



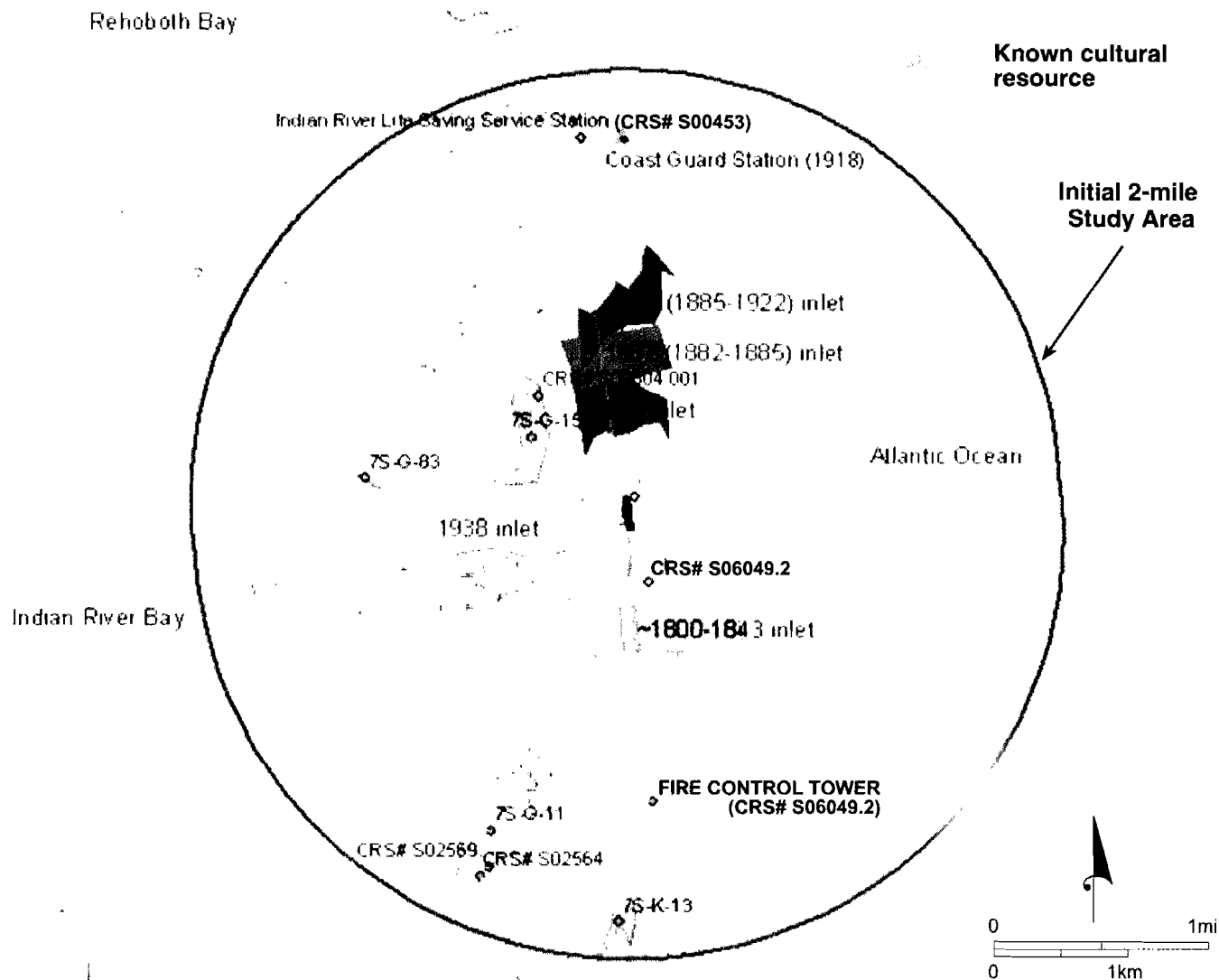


Figure 9. Map showing the locations of historic tidal inlets and cultural resources within the initial 2-mile study area.

Indian River Bay in the survey area. There are no records to indicate the major inlet's locations prior to 1800, but the nature of the barrier islands suggest other inlets have opened and closed in the preceding centuries.

The Cape Henlopen Lighthouse was built in 1767 to mark the south side of the entrance to Delaware Bay, and the Fenwick Island Lighthouse, south of Indian River Inlet, was operational on August 1, 1859 (Pearson 2002 and Rowlett 2002). North of Indian River Inlet, between the Cape Henlopen and Fenwick Island Lighthouses the Lewes Lighthouse was built in 1885 (Rowlett 2002). In 1876 a series of Life-Saving Stations were operational along the Delaware coast of which the Indian River Inlet station was one (Trapani 2002). The changes to the coastal shoreline, beach erosion and dune migration, caused the collapse of the Cape Henlopen Lighthouse in April 1926 (Pearson 2002).

Numerous ships have wrecked and run aground near Indian River Inlet over the centuries (Moale 2000 and Charles 1997). There are 250 known wrecks along the Delaware/Maryland coast and 15 of those were recorded at Indian River Inlet (Moale 2000 and Charles 1997). The Indian River Inlet shipwrecks were recorded to have mainly grounding onshore or the near shore shoals (Moale 2000 and Charles 1997). Many grounded ships and their crews were rescued after the establishment of the Indian River Inlet Life-Saving Station in the 1880s (Trapani 2002).

One of the earliest recorded shipwrecks at the Indian River Inlet was the grounding of the ship *Three Brothers* in 1775 near shore north of Indian River Inlet with the loss of over 250 people (Moale 2000). Near the site of the *Three Brothers* wreck another wreck occurred a decade later; HMS *Faithful Steward* ran aground during a storm in September 1785. The *Faithful Steward* was a three masts 350-ton ship about 150 ft. in length of United Kingdom registry (Moale 2000). The ship left Londonderry on July 9, 1785 under the command of Captain Connolly McCausland with 240 people on board bound for Philadelphia (Moale 2000). The ship ran aground 100 yards off shore but the storm was so severe only 68 persons were saved of which several of those died later of their wounds (Moale 2000). Another ship the *Ostend*, a French brig, floundered during the same storm within sight of the *Faithful Steward*, but the *Ostend's* crew made it to their lifeboats and survived (Alfano 1997).

On the night of October 22, 1891, the 28-ton fishing schooner *Red Wing* ran aground south of Indian River Inlet (Hurley and Hurley 1984). The south foot patrolman of the Indian River Life-Saving Station saw a flare from the distressed ship down the shore on the far side of the inlet (Hurley and Hurley 1984). The rescue crew from the Life-Saving Station made a courageous effort to reach the stranded vessel, but the ship was beaten apart before they could reach it (Hurley and Hurley 1984). The entire six-man crew of the *Red Wing* was lost; their bodies were recovered from the surf the following morning (Hurley and Hurley 1984). The crew of the *Red Wing* was buried in unmarked graves in the rear of the Ocean View Presbyterian Cemetery (Plate 1) (Hurley and Hurley 1984).

Ships have been continually lost along the Delaware coast, but the establishment of the life-saving stations in the 1880s provided rescue for many of the crews and their ships (Trapani 2002). An additional number of shipwrecks and rescues began around the turn of the twentieth century as pleasure craft began to cruise on the bay side of Indian River Inlet (Robert Trapani 2003). The



Plate 1. Ocean View Presbyterian Cemetery area of unmarked graves of the crew of the *Red Wing*.

advent of motorized pleasure crafts increased the work of the Life-Saving Station and later the U.S. Coast Guard (Trapani 2003).

People have continued to collect artifacts along the shore above and below Indian River Inlet from both known and unknown shipwrecks off its coast (Trapani 2003 and Clifton 2003). The stretch of beach south of the Life-Saving Station and to the north of Indian River Inlet is known as the coin beach where coins related to the cargoes of the *Three Brothers* and the *Faithful Steward* have been recovered for over a century (DSSM 1998). When the houses closest to the south end of the Indian River Inlet Bridge were being built an early nineteenth century ship's bell was recovered from shipwreck remains uncovered during the housing construction (Clifton 2003). In the last 20 years after coastal storms, interested observers have noted parts of ships and artifacts exposed west of the dunes and some near the road before they were reburied (Clifton 2003).

## 2.5 THE OCEAN HIGHWAY AND THE INDIAN RIVER INLET BRIDGE

Indian River Inlet is the common inlet for two bays, Indian River Bay and Rehoboth Bay. "Before the era of railroads and paved highways, the inlet was the heart-valve" of Rehoboth Bay-Indian River region (Eckman et al.1938:413). Settlers along the bays had used the inlet as a link to the regional market based in Philadelphia and other ports, shipping grain and forest products in exchange for fertilizer and merchandise. But the dynamic character of the Inlet – migration and alternate opening and closing – made the Inlet a difficult and dangerous opening along the Atlantic shore. The "capricious behavior" of the inlet was apparently exacerbated by the digging of the Assawoman Canal (1888-1891) south of Indian River Bay, an action that reportedly drained the bay of waters that normally served to keep the Inlet open (Eckman et al.1938:412; Kellogg and Catts 2001:21).

One Delaware historian considered the permanent establishment of the Inlet in 1934 at its present location as "the most dramatic event in the history of these waters" in over a century (Eckman et al.1938:413). Inlet openings have migrated north and south of the present location many times in the last three centuries (Figure 9). For several years in the 1920s, there was no Inlet at all, an event that resulted in a decline in the seafood industry, death of marine vegetation, and the creation of mosquito-breeding grounds (Eckman et al.1938:412). Attempts to dynamite and/or dredge a channel were unsuccessful.

Prior to the construction of the Ocean Highway in 1933, the coast between Rehoboth and Indian River Inlet was marked by but a "vague sandy trail" that wound among the dunes (Eckman et al.1938:411). As part of the Ocean Highway construction a 512-foot timber bridge was designed to cross the inlet in 1932. The bridge was described in one of the engineering drawings that accompanied Contract No. 282:

This structure is located over a dug inlet to the Indian River Bay. Its location is shown on Rehoboth quadrangle, five miles north of Bethany Beach....

Use creosoted timber piles for this structure....Southern yellow pine, Douglas fir, and Southern cypress are acceptable....Cover heads of all cut off pile with heavy building felt and treat as provided.

Use creosoted lumber for the timber in this bridge....Use all galvanized fittings on bridge. Use dense select timber of Southern pine, Douglas fir, cypress or oak sized two sides for cap, stringers and level riding surface....

The design is for a 15 ton truck hit without impact.

Timber bents for the majority of the bridge were placed 17 feet 4 inches apart on center. The central bridge span was 30 feet in length. The majority of the wood used was produced locally and creosoted at the wood preserving plant at Newport (SHD 1934:16). This bridge with its slightly humpbacked profile is shown in a series of photographs in the Delaware State Highway Department Collection of the Delaware Public Archives (Figures 10 and 11).

The bridge was erected in conjunction with the construction of the Ocean Highway between Rehoboth and the inlet. The bridge construction, Contract 282, was awarded to W.L. Sowell of Wilmington with an estimated cost of \$11,875. The 6.2 mile road segment, Contract 283, was awarded to Highway Engineering and Construction of Selbyville at an estimated cost of \$67,940 (SHD 1933).

The Ocean Highway between Bethany Beach and Rehoboth, constructed of gravel, opened to traffic in August 1933, connecting the state's two principal shore resorts. On 23 August, 1933, a large storm hit the southern Delaware coast (see Section 2.4 above). Little damage occurred to the section from Bethany Beach to Indian River Inlet, while the section north of the Inlet was badly washed in numerous places, particularly between the old Inlet (identified as the "1918 Inlet" in Figure 12) and the bridge. Damage was estimated to amount to \$10,000 (SHD 1933:40, 42). To increase the stability of the roadway, the segment south of the bridge was treated with slow curing, cut back asphalt mixed in place (SHD 1933:44). The length of highway was paved in 1940 (Meehan 1998:147).

This section of the Ocean Highway was frequently pummeled by storms. The 1936 annual report of the Highway Department reported that the highway between Rehoboth and Bethany Beach was closed for only one day following a severe storm in September. Dykes and sand fences were restored and strengthened. The same report indicated that opportunities for fishing, crabbing, boating and bathing had led to the increasing use of the road. The report recommended that the Ocean Highway be continued to Fenwick Island during the following year (SHD 1936:39, 41).

This timber bent span was replaced by the \$165,900 Charles W. Cullen Bridge, named for the chairman of the State Highway Commission. This bridge, which was constructed 50 feet east of the existing bridge, was described as follows:

The bridge will have a total length of 691 feet consisting of a swing span 182 feet long, furnishing two clear channels between fenders of 60 feet each. The approaches are of creosoted timber pile construction with a composite laminated timber deck and reinforced concrete floor and railings, providing a roadway 24 feet in width and a 4-foot sidewalk.



Figure 10. View southeast showing 1930s Indian River Inlet Bridge. Delaware State Highway Department collection. Image #2432. Delaware Public Archives, Dover.





Figure 11. Close-up view of 1930s timber bent Indian River Inlet Bridge. Delaware State Highway Department collection. Image #2546 pn. Delaware Public Archives, Dover.

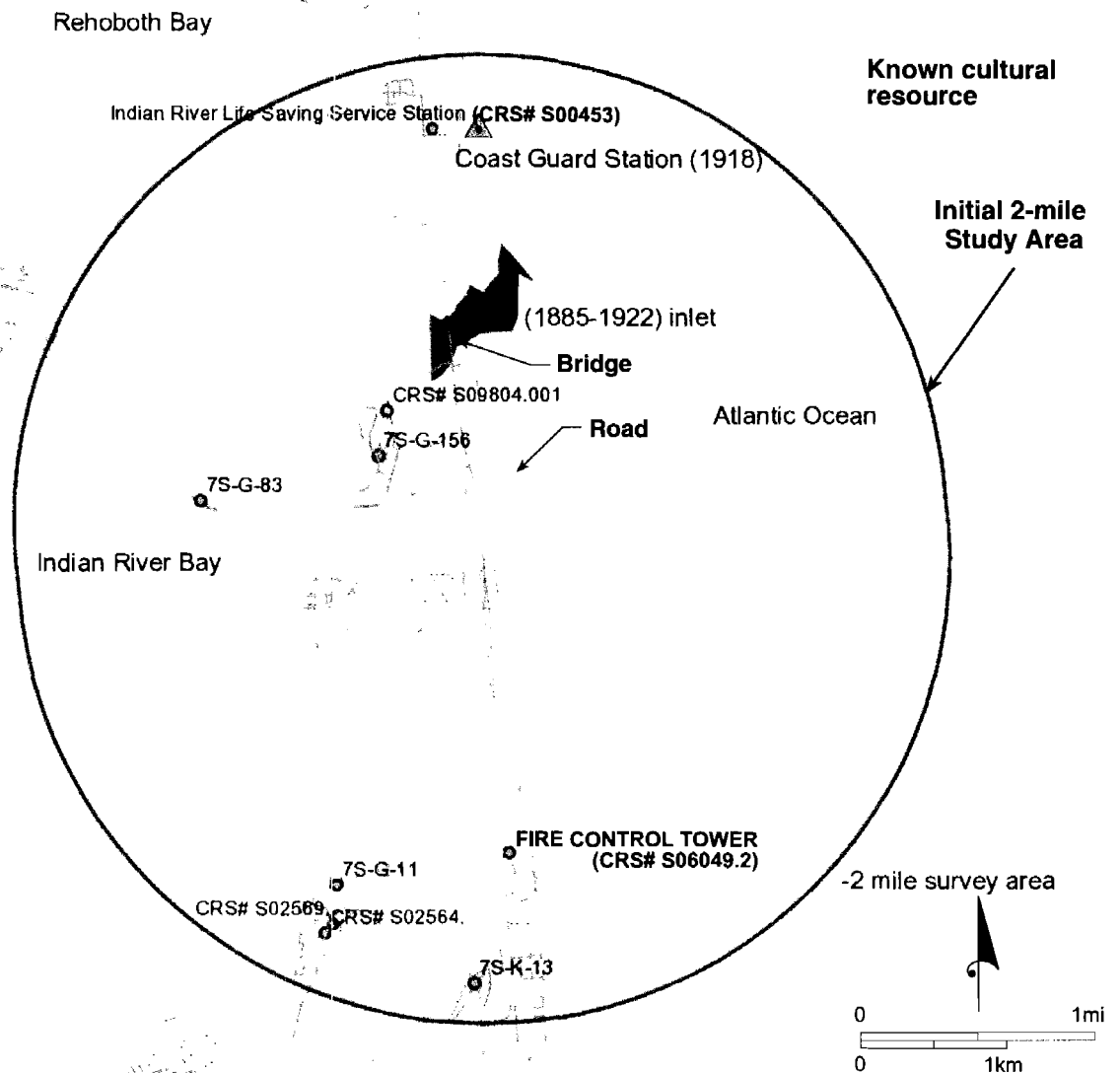


Figure 12. Map showing the location of the 1918 inlet and associated bridge and road within the initial 2-mile study area.

Sand beneath water makes an excellent basis for bridge foundations and little trouble is anticipated by state engineers in construction of the bridge (SHD 1938:19).

Material required for construction included 70,000 pounds of reinforcing steel for the approaches, 22,000 pounds for piers, 325,000 pounds of structural steel for the swing span. A total of 45,000 pounds of machinery was installed (Figures 13 through 16). The bridge was powered by a gas engine and equipped with a modern signal light system. The 1939 Highway Department report indicated that the bridge should be completed and opened for traffic the following spring (SHD 1939:21). It opened for traffic on May 18, 1940 (SHD 1940:5).

The bridge was made necessary and was part of an agreement with the United States Army Corps of Engineers for the construction of a permanent 500-foot wide inlet with steel and stone jetties extending into the Atlantic Ocean to the 15-foot contour. By 1938, dredging of the inlet had been finished and jetty construction was nearing completion (SHD 1938:19, 21).

Bridge construction proceeded more slowly than anticipated due to strong currents through the inlet in the fall and winter. Traffic was maintained over the old bridge (SHD 1938:21). The Cullen Bridge consisted of timber bent approach spans and a steel girder swing span. The entire bridge featured concrete balustrades. The bridge operator's hut was cantilevered from the swing span.

The south approach trestle of the bridge, six spans totaling 116 linear feet, was destroyed on February 10, 1948 due to an unusual combination of tide, wind and ice (Figure 17). The chronology of the failure were described in a report by the consulting engineering firm, Howard, Needles, Tammen and Bergendorff of New York:

For about a week prior to the failure there had been periods when ice was running in the Inlet....Such flows of ice generally lodged against the east side of the bridge, piling up on the piles to heights of four or five feet, and forming an ice field east of the bridge. When the tide changed the ebb tide quickly carried this away from the bridge and out to sea.

On the morning of February 10<sup>th</sup> a similar flow of ice was carried into the Inlet with the tide aided by a northeast wind of approximately 30 miles per hour. It appeared to have no more effect on the bridge than had those of previous days, yet while the bridge tender was absent to report by telephone to the Department Engineer that there was no evidence of distress in the bridge, the failure occurred....

At the time of the failure a light truck and an automobile were on the portion of deck which failed...The fallen deck was carried inland by the ice and finally sank to the bottom about 250 feet west of the bridge. There were three lives lost at this time (SHD 1948:46-47).

The principal causes were deemed to be the flow of ice in the inlet combined with deep scour. The engineers' report described proposed repairs to the bridge:

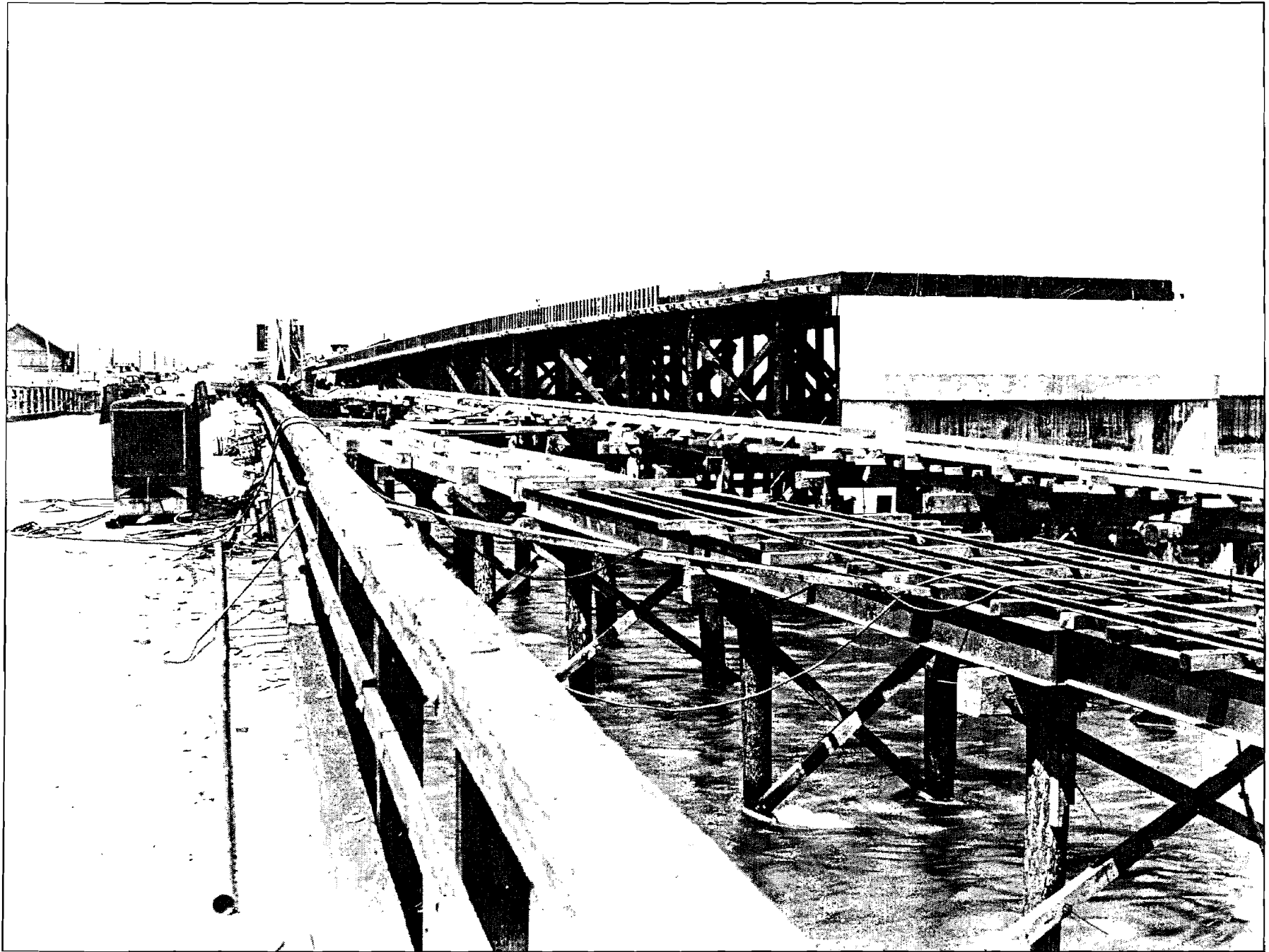


Figure 13. View toward north from old bridge showing Cullen Bridge under construction. June 12, 1939. Delaware State Highway Department collection. Image #0328. Delaware Public Archives, Dover.

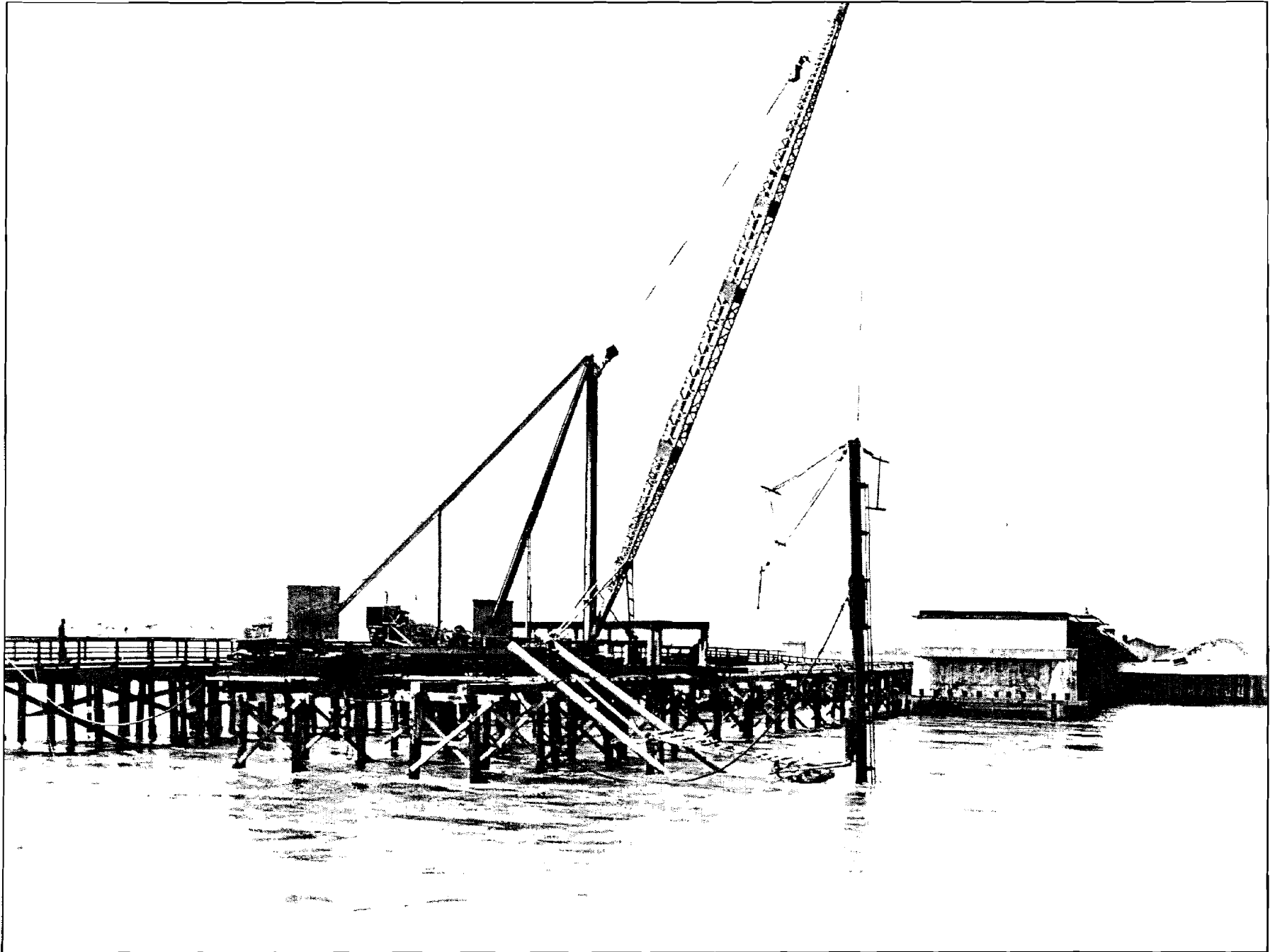


Figure 14. Cullen Bridge construction. North rest pier vicinity toward northwest. June 12, 1939. Delaware State Highway Department collection. Image #0333. Delaware Public Archives, Dover.

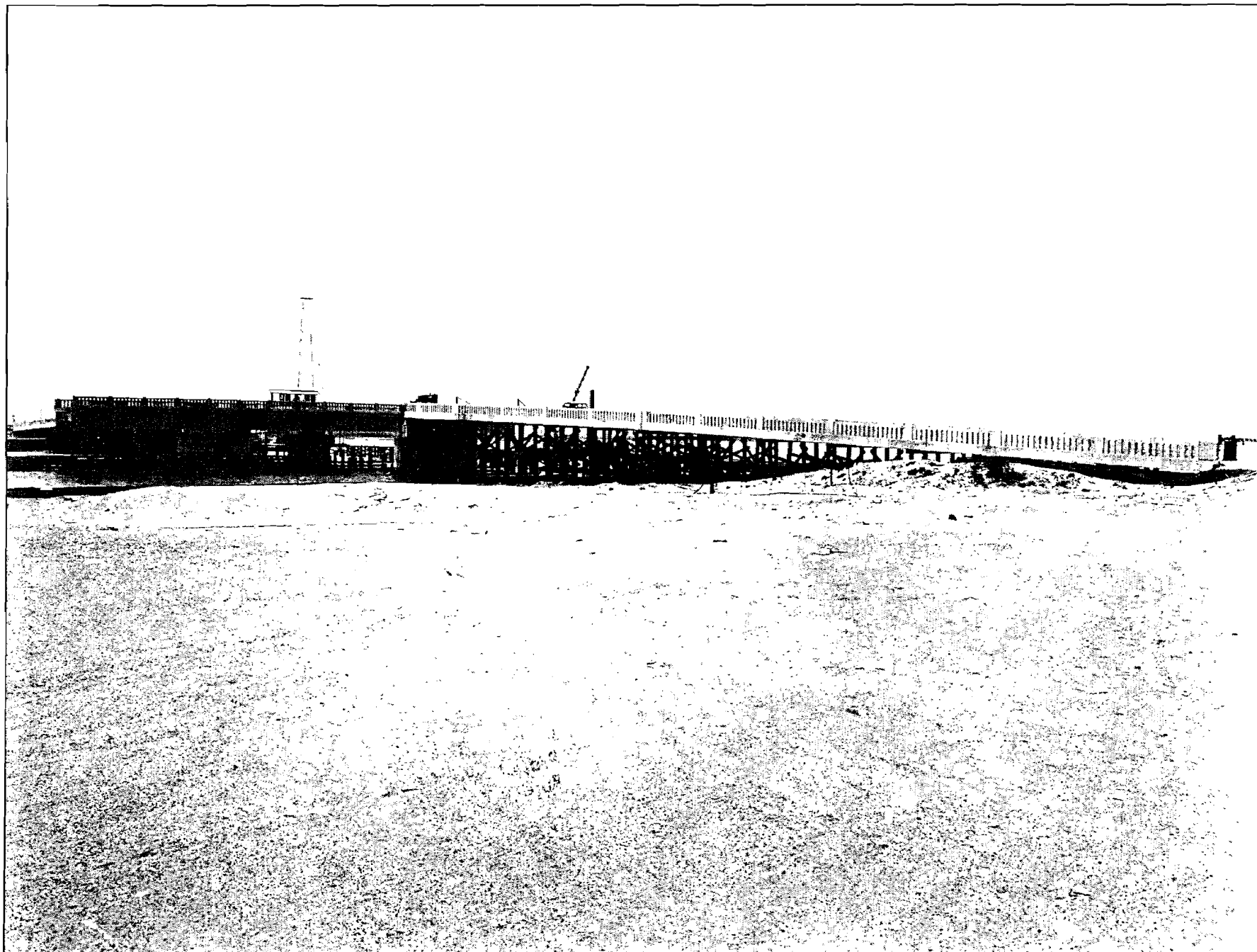


Figure 15. Cullen Bridge. North approach toward southwest. June 21, 1940. Delaware State Highway Department collection. Image #0327. Delaware Public Archives, Dover.

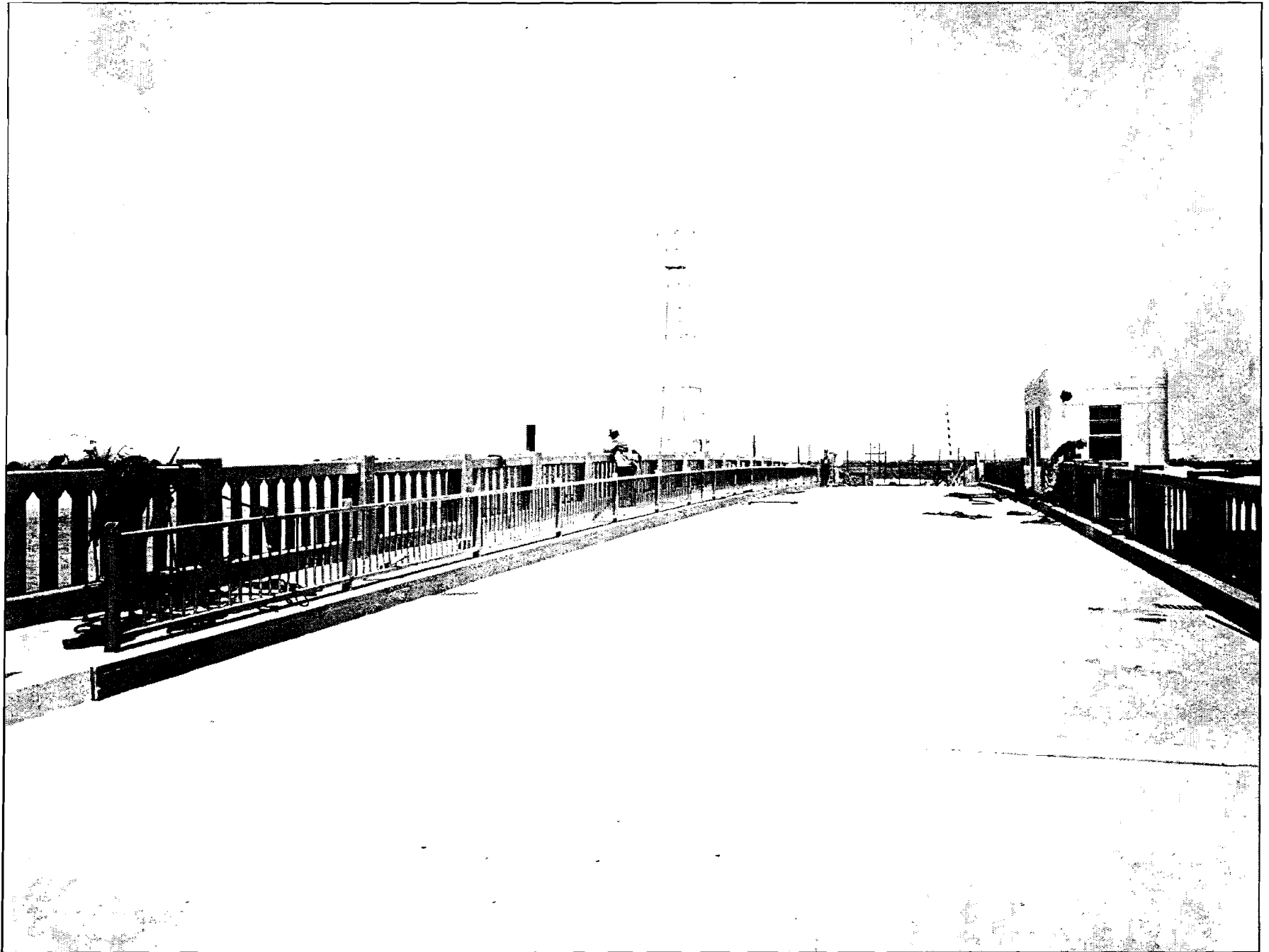


Figure 16. Cullen Bridge deck toward south. Note operator's hut at right. July 30, 1940. Delaware State Highway Department collection. Image #0332. Delaware Public Archives, Dover.



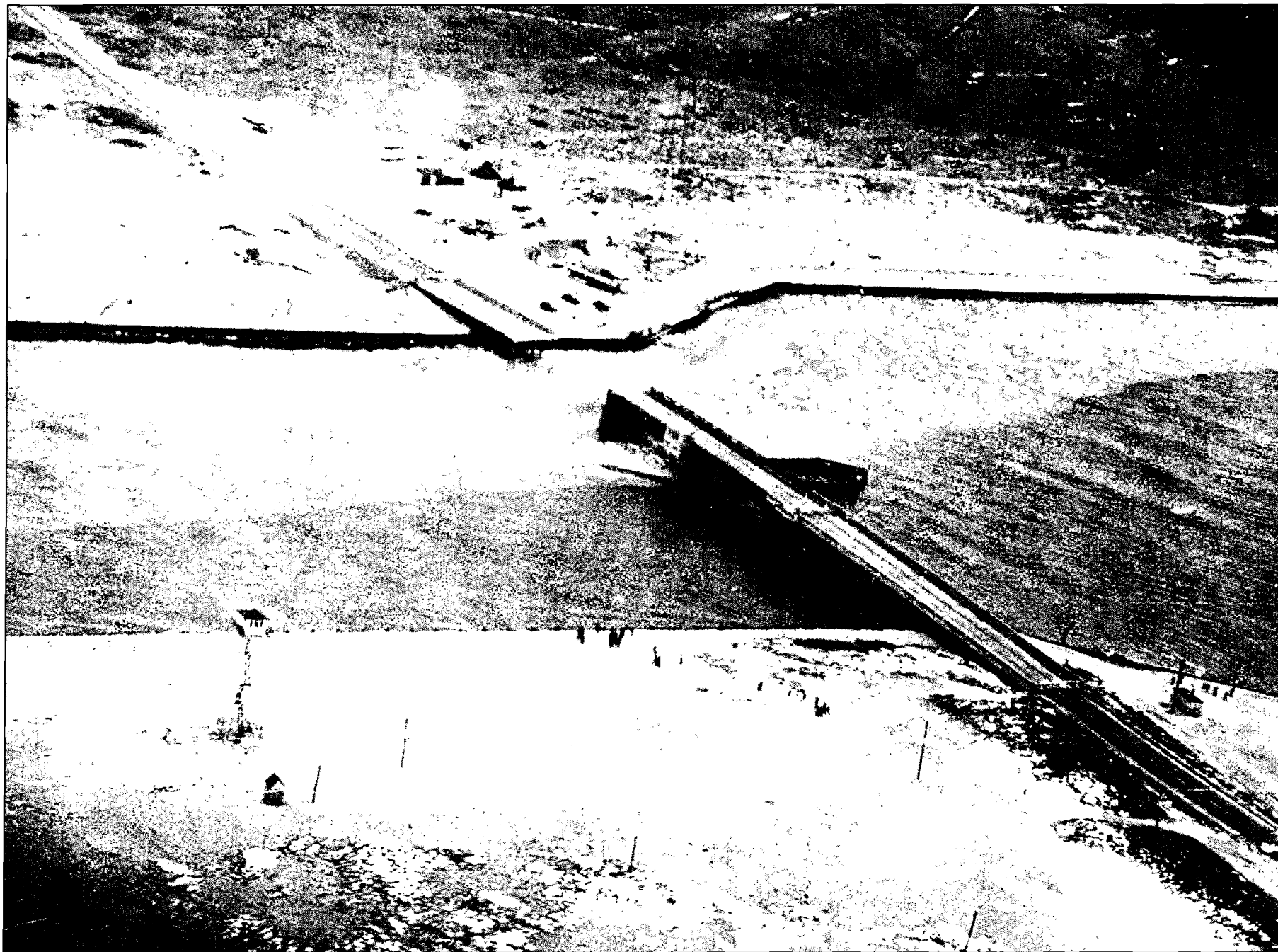


Figure 17. Aerial view of Cullen Bridge after destruction of south bridge trestle toward southwest. RG 1325. General Photo Collection: Transportation.  
Image #78pn.98136. Delaware Public Archives, Dover.

The south rest pier base will be enlarged by driving steel sheet piling around it and about four feet clear from it so as to permit the driving of a new row of piles entirely around the pier. The steel sheet piling will be driven well below the bottoms of the existing pier and will be left in place so as to give protection against attack of teredo to the untreated timber piles of the existing pier. This sheet piling will also be used as a part of the new fender.

Two steel beam spans will be provided for the south approach to extend from the south rest pier a distance of about 194 feet. They will be supported on the south rest pier, on one new pier in the Inlet, and on a second new pier about 28 feet south of the jetty. The existing trestle within this length together with the temporary trestle now being constructed to replace the portion of the approach which was destroyed will be removed (SHD 1948:49).

A temporary single lane timber trestle was constructed in May 1, 1948. This trestle was constructed by Thomas Earle and Sons at a cost of \$34,290.42 (SHD 1948:51). The 1949 report indicated that the trestle remained in use and was being inspected daily to insure safety. A consultant had been engaged to prepare plans for a replacement south approach and for construction of a new fender system (SHD 1949:22).

Initial plans for the approach replacement were prepared and proposals were opened on August 10, 1949. Upon review and study the bids were withdrawn due to the high cost of construction. A new design was prepared and new proposals were received on March 15, 1950. After additional delays due to failure of equipment and materials to arrive on the site, permanent replacement of the south approach span was begun on May 8, 1950. The replacement was completed on June 9, 1951 (SHD 1950:36, 38; 1951:23). Department of Highways annual reports subsequently recommended the replacement of the north approach of the bridge at an estimated cost of \$450,000 (see for example SHD 1952:43). This approach was never replaced. Instead, a new bridge was constructed.

Coastal storms continued to endanger the Ocean Highway in the 1950s. During a 1950 storm, 1,000 feet of the highway north of the Inlet was washed out. In November 1953, water broke through to the highway. Hurricane "Flossie" in 1956 caused several breaks in the dunes, the most serious at the former inlet location. As a result of this break, several buildings were damaged. (SHD 1956:39A). Beach recession and highway damage was a much less severe problem south of the Inlet (SHD 1956:41).

The north approach of the bridge was damaged by a March 1962 storm. The timber trestle was repaired on an emergency basis with steel "H" beam piling and 36-inch deep steel needle beams across the roadway to support the deck without assistance from timber bents. The storm had displaced some of the timber piles from their position under the caps (SHD 1963:20). The funds for this repair were awarded under contract #2026 (SHD 1962:61).

In the 1962-1963 fiscal year, two contracts were awarded for construction of a new Indian River Inlet Bridge. The first, #1880, for the bridge itself, totaled \$1,559,973. The second, #1880-3, for bridge approach fill, totaled \$159,985 (SHD 1965). By 1965, the twin span bridge was nearing completion (SHD 1965:22).

The bridge is a steel girder span supported by twin concrete hammerhead piers (Plates 2 and 3). Almost from its opening, severe tidal erosion began to undermine the bridge's piers. Tidal currents led to regular substantial maintenance costs and eventually led to the decision that a new bridge was necessary, a bridge which may eliminate piers from the inlet.



Plate 2. Existing Indian River Inlet Bridge. East elevation toward northwest.

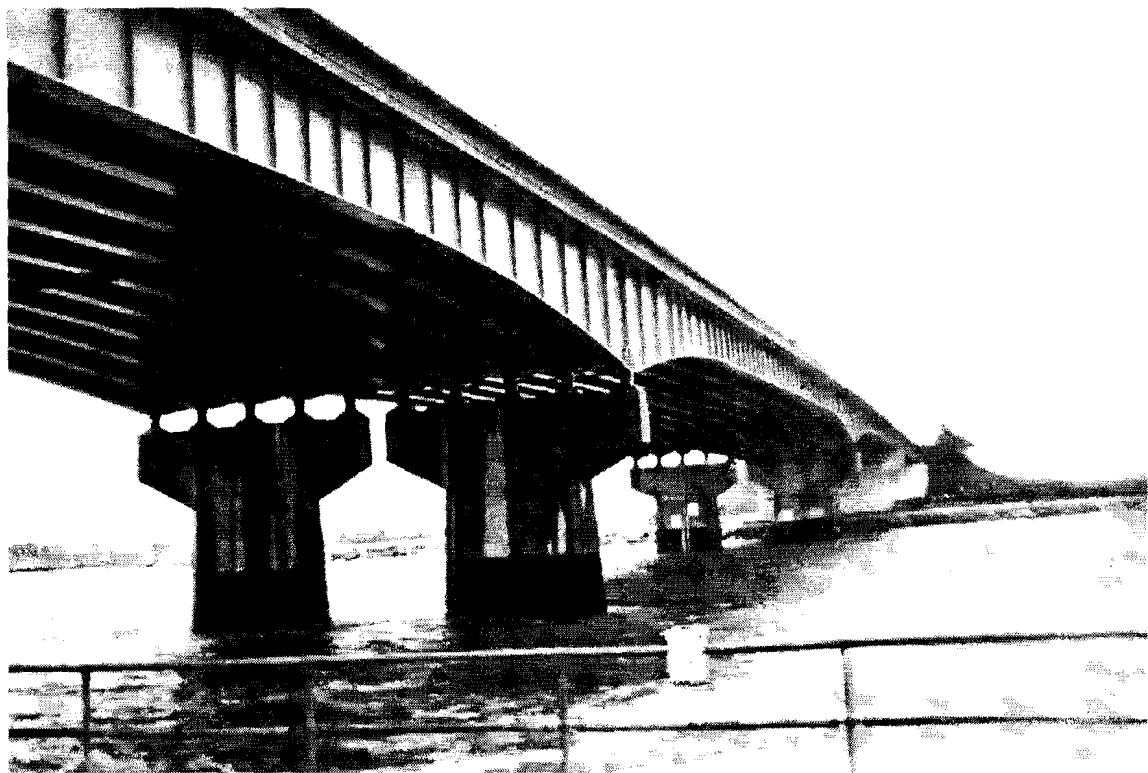


Plate 3. Existing Indian River Inlet Bridge. Detail of east elevation showing piers in inlet toward northwest.